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Environmental Protection Agency, Washington, D C

Jul 74

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JULY 1974

EXPRO '75

A LISTING OF EXTRAMURAL PROJECTS TO BE FUNDED IN FISCAL YEAR 1975

OFFICE OF RESEARCH AND DEVELOPMENT
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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The purpose of EXPRO is two-fold: (1) to acquaint the research and development community with general guidelines for working with the Environmental Protection Agency's Office of Research and Development under grant or contract support, and (2) to make publically available a list of specific grant and contract Tasks which OR&D plans to fund during the current Fiscal Year. This listing is planned to be issued at the beginning of each new fiscal year. Although grants and contracts are authorized under various pieces of legislation, the general procedures for seeking support have been unified to those discussed.

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FOREWORD

The Office of Research and Development's **EX**tramural **PRO**gram Information Bulletin (**EXPRO**) is meant to inform you as to how to "do business" with the Office of Research and Development and to provide you with a listing of "Tasks" planned to be funded as research and demonstration projects by this Office during each Fiscal Year.

We greatly need the best available talent of the academic, scientific and industrial community to be applied to the difficult and complex research problems in the field of environmental quality. It is sometimes difficult to obtain comprehensive information regarding the research needs and interests of the Environmental Protection Agency. EPA's **EXPRO** alleviates this difficulty by providing information to all interested parties regarding the subjects and goals of individual grant and contract tasks planned for the current Fiscal Year.

Let me emphasize that **EXPRO** is a "planning document" which is issued even before our annual program plan has received final approval and often even before our annual appropriations are available. Some Tasks listed may, therefore, not ultimately be funded. Moreover, because there are inveitable delays in the printing and distribution of **EXPRO**, a number of weeks may pass between completion of our detailed program plan and your receipt of this document. Also, since the funding of "Tasks" is a dynamic process, we are continuously awarding grants and contracts in order to meet our goals and objectives. For this reason, some grantees or contractors may have been selected or some projects may have been deferred during the interim period between publication and actual receipt. You should recognize, therefore, that the information contained in this publication will not be completely current.

In order to save you and EPA both time and effort, we urge you to contact the "Cognizant PAM/PED" listed for each Task in Part II of this document to ascertain which projects remain unfunded prior to submission of either a formal proposal or preproposal.

Albert C. Trakowski
Acting Assistant Administrator
for Research and Development

Hand-out copies of EXPRO '75 are available from the Research and Development Representative in each of EPA's ten Regional Offices, from EPA's National Environmental Research Centers and Associated Laboratories throughout the country and from the Office of Research and Development, Headquarters, Washington, DC. Mail requests for additional copies should be addressed to:

Allowance Staff (RD-674)
Office of Research and Development
Environmental Protection Agency
Washington, DC 20460

If you wish to receive supplements to EXPRO 75 and EXPRO 76 complete and return the form located at the back of Part I of this publication.

EXPRO '75
OFFICE OF RESEARCH and DEVELOPMENT
EXTRAMURAL PROGRAM INFORMATION BULLETIN
FISCAL YEAR 1975

The Environmental Protection Agency's Office of Research and Development (OR&D) conducts and supports research, development and demonstration efforts on a wide variety of subjects primarily related to pollution sources and effects, environmental sciences and pollution control technology. OR&D also is responsible for assuring the quality control and standardization of analytical techniques for the detection and quantification of pollutants of interest to the Environmental Protection Agency as well as promoting, through technology transfer, the use of new techniques, processes, methodologies, etc., in pollution control.

EPA was formed in late 1970 from programs in a number of executive agencies — e.g., the Department of Health, Education and Welfare (air pollution, solid waste, radiation, water hygiene and noise), the Department of the Interior (water pollution) and the Department of Agriculture (pesticide regulation). Research and demonstration grants and contracts were supported by many of the precursor programs under guidelines of their respective Departments. With the melding of these programs into a single Agency, the extramural activities in support of research and development have likewise been integrated.

The purpose of EXPRO is two-fold: (1) to acquaint the research and development community with general guidelines for working with the Environmental Protection Agency's Office of Research and Development under grant or contract support, and (2) to make publically available a list of specific grant and contract Tasks which OR&D plans to fund during the current Fiscal Year. This listing is planned to be issued at the beginning of each new fiscal year. Addenda to EXPRO, containing the Task Number and page reference of those Tasks for which a grantee or contractor has not yet been selected, will be issued periodically during the fiscal year. Any new Research Objective Achievement Plans and/or new Tasks and PAM/PED changes will be included in these addenda. We believe this will present the most timely and accurate picture of the Tasks for which EPA is seeking proposals at any given time.

Although grants and contracts are authorized under various pieces of legislation*/, the general procedures for seeking support have been unified to those discussed below.

*/See Appendix A for citations of legislative authority and the conditions, limitations, etc. related thereto.

PART I

GENERAL GUIDELINES FOR DEVELOPING GRANT OR CONTRACT PROJECTS

OR&D Objectives and Organization

The Office of Research and Development establishes its objectives and priorities in response to the overall mission and priorities of EPA and is highly mission-oriented, concerned with solving specific priority problems rather than only advancing scientific knowledge. Although the scopes of OR&D projects may vary from quite fundamental research to the full-scale engineering demonstration of new pollution control processes, all projects are directed at meeting specified objectives. Applications may be submitted on any subject at any time, but all grant and contract proposals will be evaluated in the context of pre-established plans.

The OR&D planning process places program definition responsibility in Headquarters and program execution responsibility in the National Environmental Research Centers (NERC's) at Cincinnati, Ohio, Corvallis, Oregon, Las Vegas, Nevada, and Research Triangle Park, North Carolina and at the Washington Environmental Research Center (WERC), Washington, D.C.**/. In both the program definition and program execution process, OR&D activities are grouped into a number of discrete subject categories or "Program Elements". Responsibility for managing all activities within a given set of Program Elements is held by a designated "Program Area Manager" or "PAM" at Headquarters; for each Program Element, his counterpart in one of the NERC's or WERC is designated the "Program Element Director" or "PED". The PAM is responsible for establishing the objectives and priorities within the Program Element, for allocating to the PED the resources necessary to implement the planned program and for monitoring over-all Program Element progress. The PED is responsible for project planning and for directing the efforts to achieve assigned objectives through the use of his own research staff as well as through the development and award of contracts and grants. Narrative descriptions of all OR&D's Program Elements and the names and locations of corresponding PAM's and PED's are provided in Part II.

In addition to OR&D's Headquarters and laboratory personnel, each EPA Regional Office employs one or more staff members designated as Regional Research and Development Representatives. These individuals, see Appendix C, assist OR&D in identifying research needs of importance within each Region and promulgate the results of research and development projects among the "user community" both within and outside of EPA. These Regional R&D Representatives are also generally aware of the activities and objectives of the various programs of OR&D and can provide much useful information about its method of operation, organization, points of contact on various subjects, etc.

**/See Appendix B for organizational charts for Headquarters and the four National Environmental Research Centers and the Washington Environmental Research Center.

The subject categories or Program Elements into which OR&D's activities fall may be grouped into 11 major Program Areas.

These Program Areas are:

Health Effects	—	epidemiological studies, toxicological research, teratological research, air/water/radiation/noise quality standards development, etc.
Ecological Processes and Effects	—	studies of terrestrial and aquatic ecosystems, as impacted by pollutants; meteorological research, pollutant interactions and fate in the environment, eutrophication, etc.
Municipal Pollution Control Technology	—	advanced waste treatment, water renovation, storm and combined sewer overflows, water supply technology, etc.
Industrial Pollution Control	—	treatment and control of industrial water pollution
Nonpoint Pollution Control	—	mining and agricultural water pollution control, control of oil and hazardous material spills
Air Pollution Control	—	control technology for sulfurs, nitrogen oxides, particulates, etc.
Data and Information Research	—	research and development on scientific data and information systems, etc.
Equipment & Techniques Research	—	methods and instrumentation for the detection, identification and quantification of pollutants, etc.
Quality Assurance	—	establishment and coordination of an Agency-wide standardization and quality control program for measurement of pollutants and environmental quality
Socio-Economic Research	—	interdisplinary research to develop and demonstrate the analytical technique required to implement Agency programs

In addition to the above Program Areas, the Office of Research and Development sponsors a Minority Institutions Research Support Program (MIRS). The MIRS Program seeks and assists minority institutions in establishing interests in the environmental sciences and in developing research capability in these areas. Research grants awarded under this program are mission-oriented projects related to specific environmental problems. Tasks listed in Part II are generally eligible for funding under the MIRS Program. Detailed information on MIRS can be obtained from the Director, Minority Institutions Research Support Program, Office of Research and Development, Environmental Protection Agency, Washington, D.C. 20460, telephone (202) 755-0639.

Office of Research and Development's Grant and Contract Activities***/

As the specific objectives within each Program Element are established, a series of "Tasks" are devised which will lead to attainment of the various planned objectives. Some of these Tasks will be carried out directly by EPA's staff while others are planned for accomplishment by grant or contract. Brief descriptions of each of these grant or contract Tasks are provided in PART II along with the approximate amounts of funds available for carrying out the grant Tasks and the contract Tasks listed within each Program Element. The expected "funding mechanism", i.e., grant or contract, and the "legislative authority" under which the work is planned to be done are also listed. Based upon the Authorizing Legislation Code indicated for each Task, an applicant can determine from Appendix A what eligibility requirements, cost sharing, funding limitations, etc. will apply.

All planned contracting is carried out competitively with notices of the availability of Request for Proposal (RFP) documents publicly advertised. Unsolicited contract proposals should *not* be submitted for such projects. The review/selection procedures followed may vary slightly from project to project, but all pertinent information regarding both the project objectives and criteria for evaluation of proposals will be included in each RFP package. Neither PAM's nor PED's should be contacted for information on individual contract Tasks since such communication may conflict with Federal Procurement Regulations and could serve to disqualify a prospective contractor from further consideration.

With regard to all Tasks indicated to be funded by grants, contact with the cognizant PAM or PED is encouraged. In general, the PAM will be better able to respond to questions relative to over-all Program Element objectives, long-range planning, and program interactions within EPA while the PED will have more detailed information on individual Tasks and will, in fact, generally be the individual responsible for making the award/reject recommendation on individual proposals. Another source of information and assistance, particularly for general inquiries, is the OR&D Representative in each EPA Regional Office. These individuals can often give helpful guidance to those who find that their need for information relative to a specific subject is not satisfied by this document.

***/Note: Information on other EPA grant programs is presented in the booklet, "Grant Assistance Programs of the Environmental Protection Agency", available from EPA's Grants Administration Division, Washington, DC 20460. Information on contracting procedures and policies is presented in the booklet, "Contracting with EPA — A Guide for Prospective Contractors", available from EPA's Contracts Management Division, Washington, DC 20460.

Guidelines For Submission Of Grant Applications Or Contract Proposals

A. Solicited contract proposals –

Requests for Proposals (RFP's) for all planned contract Tasks will be advertised in the Commerce Business Daily issued by the U.S. Department of Commerce. A subscription to this publication may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402. These advertisements will provide instructions for obtaining RFP packages from EPA's Contracts Management Division. Each RFP package will include detailed information on the form and context of proposals to be submitted as well as the required time and place of submission.

EPA's Contracts Management Division publishes a "Guide for Prospective Contractors" to assist the business community in its efforts to find new markets in the Environmental Protection Agency. This publication includes the names and addresses of contracting offices in EPA, the types of products and services procured, general information about the Agency, and hints to aid businessmen in selling to EPA.

B. Unsolicited contract proposals –

While most of OR&D's contract research and demonstration is conducted through use of RFP's to solicit proposals (item A above), contracts can also be awarded on the basis of unsolicited proposals which meet the sole-source requirements of the Federal Procurement Regulations. Unsolicited contract proposals should be addressed to the Grants Administration Division (PM-216), Environmental Protection Agency, Washington, DC 20460. While no specific format is required, such proposals should generally contain:

1. Name, address and telephone number of the organization or individual submitting the proposal.
2. Date of preparation or submission.
3. Type of organization (profit, non-profit, educational, individual, other).
4. Concise title.
6. Project objective.
7. Need, utility and significance of project.
8. Scope of work, i.e., an outline and discussion of the purpose of proposed effort of activity, the method of attacking the problem, and nature and extent of anticipated results.
9. Experimental data developed by feasibility studies previously completed.
10. Estimated duration of the project, proposed starting and completion dates.
11. Scientific or technical references.
12. Names of key personnel to be involved, brief biographical information, including principal publications and relevant experience.
13. Equipment, facilities and personnel requirements.
14. Proposed budget, including separate cost estimates for salaries and wages, equipment, expendable supplies, services, travel, subcontracts, other direct costs and overhead.

The material submitted should contain both a *technical* and a *business* proposal. The *technical* proposal should clearly define the unique concept involved (as required for sole-source procurements) and include a plan for turning the concept into reality. It is suggested that the technical proposal identify any proprietary aspects of the proposed ideas or process. The *business* proposal should include a detailed cost proposal, information concerning past Government contracts, and any special terms and conditions desired.

C. Research or demonstration grant applications –

Pre-application activity —

Although grant applications may be submitted at any time an on any subject, potential grantees should take the following actions prior to submission of a formal grant application in order to save time and effort both for the applicant and EPA.

1. Review OR&D's current list of grant Tasks to be funded in the specific area of interest (PART II of this document) to determine whether these objectives match the applicant's research interests and capabilities: and

2. Contact the appropriate research and development personnel cited in this document to ascertain which projects remain unfunded prior to submission of an official grant application.

Submission of a preproposal is also strongly encouraged. The preproposal should be sent directly to the "Cognizant PAM/PED" listed in Part II of this document for review. A preproposal should normally consist of a three or four-page narrative outlining the project concept and containing the following information:

1. **Objective** – a clear statement of the specific objective is necessary. If the objective is designed to fulfill a specific Task or Tasks (as identified in Step 1 above), the Task(s) should be identified. If the objective cannot be associated with any specific Task, some statement of the presumed value to EPA of attaining the research objective should be made.

2. **Project Plan** – a brief description of the research/development/demonstration concept and the plan for execution of the proposed project, including a projected time-schedule for accomplishments of intermediate outputs or key occurrences indicating progress (milestones) and the final objective.

3. **Budget** – a preliminary estimate of total costs which will be incurred in order to complete the project. Also, the share of the costs which will be provided by the applicant should be indicated.

4. **Staff and Facilities** – a brief listing of key project staff and capabilities and a brief description of any special facilities or other factors which would contribute to the success of the project. A single person who will have responsibility for planning, coordinating, and supervising the project should be identified along with the fraction of his time to be devoted to the project.

Following review and evaluation of the preproposal by the "Cognizant PAM/PED", the prospective applicant will be advised whether (a) an application should be submitted for formal review, (b) submission of a modified preproposal is suggested, (c) possible submission of the preproposal to another Agency, Department, or source of funds is suggested, or (d) further pursuit of the particular topic is discouraged.

Formal applications —

All formal grant applications are to be submitted to the Grants Administration Division, Environmental Protection Agency, Washington, DC 20460. After formal "logging in" and acknowledgement, submissions are referred to the Office of Research and Development for program relevance review by the cognizant Program Element Director. This review quickly screens out those applications for which EPA has no authority or interest or those for which no funds are available. For relevant proposals, scientific/technical merit reviews are then conducted by *both* in-house and extramural experts. Extramural reviews are obtained in the National Science Foundation fashion — individual written reviews submitted by mail. Comments are also obtained from the Regional Office in the Region where the project would be conducted to determine the relationship of the proposed project to Regional programs and policies.

The individual coordinating the scientific/technical merit review (normally the cognizant PED) assembles and evaluates both intramural and extramural review comments and prepares a recommendation for action on each application. The recommendation may be to award a grant, to reject the application, or to attempt to negotiate with the applicant to modify the scope of work. In those cases where the proposed scope of work could be modified in order to relate more directly to EPA's objectives and thereby qualify for funding, direct contact is made with the applicant to determine whether or not acceptable adjustments in the scope of work can be made.

ATTENTION! WE ARE REVISING OUR MAILING KEY!

All individuals who wish to receive supplements to **EXPRO 75** or **EXPRO 76** must complete this page. In addition, individuals who wish to receive the **OR&D Publications Summary** as described below must also complete this page. This page should be returned to the following address:

Allowance Staff (RD-674)
Office of Research and Development
Environmental Protection Agency
Washington, DC 20460

The Summary contains both abstracts of forthcoming final reports to be issued within the next few months and a listing of available final reports published during the previous twelve month period. All reports contained in the Summary are prepared upon completion of in-house, grant, contract and interagency agreement Tasks supported by OR&D.

I wish to:

____ Receive a copy of **EXPRO 75** and be placed on the mailing list for supplements and **EXPRO 76**.
____ Remain on the mailing list and receive supplements and **EXPRO 76**.
____ Have my name placed on the mailing list for supplements and **EXPRO 76**.
____ Receive the OR&D **Publications Summary**.

To allow us to inform our PAM's and PED's of the areas of interest of our addresses, please indicate those Program Areas listed below which identify your interest. Descriptions for each Program Area can be found on the pages indicated in the Table of Contents.

____ HEALTH EFFECTS PROGRAM AREA
____ ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA
____ MUNICIPAL POLLUTION CONTROL PROGRAM AREA
____ INDUSTRIAL POLLUTION CONTROL PROGRAM AREA
____ NONPOINT POLLUTION CONTROL PROGRAM AREA
____ AIR POLLUTION CONTROL PROGRAM AREA
____ DATA AND INFORMATION RESEARCH PROGRAM AREA
____ EQUIPMENT AND TECHNIQUES PROGRAM AREA
____ QUALITY ASSURANCE PROGRAM AREA
____ SOCIO-ECONOMIC RESEARCH PROGRAM AREA

Name of Organization

Sub-Division or Department

Street Address

City State Zip

Individual Contact

PART II

LISTING OF GRANT AND CONTRACT TASKS

HEALTH EFFECTS PROGRAM AREA

Health effects research is directed toward assessment of health hazards associated with environmental pollution from a number of media and categories including air, water, pesticides, radiation and noise. Various disciplines are brought together for this purpose. Major program emphasis is devoted to the Community Health and Environmental Surveillance Studies (CHESS) Program. CHESS consists of a series of epidemiologic studies in various communities throughout the United States whose objectives are to evaluate the effects of exposure to common pollutants upon sensitive health indicators.

Complementing CHESS is the Biomedical Research Program which is directed at assessing, at the community level, the effects of pollutants upon human physiology. Evaluations of health effects resulting from community level environmental pollution and classical and innovative toxicologic research studies are conducted. Scientific information on the health effects associated with exposures to fuels, fuel additives and their combustion products is collected. Pesticides, radiation and specific toxic substances are evaluated in studies conducted within this program area.

The cumulative output from all of these programs will provide needed health intelligence required to formulate environmental policies protective of public health.

Program Area Manager (PAM):

Dr. J. Wesley Clayton
Health Effects Division (RD-683)
Office of Research and Development
Environmental Protection Agency
Waterside Mall
Washington, DC 20460
Telephone: (202) 755-0614

PROGRAM ELEMENT NO. 1AA001 - POLLUTANT CHARACTERIZATION

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: See RFP when issued

Program Element Output: Documentation of the effects of air pollution constituents and recommendation of standards for these pollutants for both ambient air quality and emissions limitations. Program efforts will be to: (1) revise criteria documents and recommend revised ambient air quality standards for fine particulates, sulfur dioxide, nitrogen dioxide, carbon monoxide, photochemical oxidants, hydrocarbons and others; and (2) recommend control approaches for various pollutants including, among others, manganese, nickel, chromium, vanadium and polycyclic organic materials. In addition, this program will support the setting of National performance or emission standards for a variety of specified sources, such as aircraft, motor vehicles, industrial categories and sources of hazardous pollutants.

Program Element Director (PED):

Dr. F. Gordon Hueter
Special Studies Staff
National Environmental Research Center
Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 549-8411

PROGRAM ELEMENT NO. 1AA001 – POLLUTANT CHARACTERIZATION

Research Objective Achievement Plan 26AAA: **Air Quality Criteria/Scientific Summary Documents**

Objective: Revise air quality criteria documents for SO_x, Particulate, NO_x, Photochemical Oxidants, Hydrocarbons and CO. Scientific summary documents for specific environmental pollutants which consider properties, measurement, levels, transport, control, exposure, health and welfare effects. Briefing reports identifying new problem areas. Assistance to WHO and other international groups for the development of environmental pollutant guidelines and criteria. Identify knowledge gaps for new research program planning.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAA-034	Select and prepare documentation on new pollutants.	Contract	103	Hueter

PROGRAM ELEMENT NO. 1AA005 – COMMUNITY HEALTH EFFECTS SURVEILLANCE STUDIES (CHESS)

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $ 360,000
Contracts: $3,020,000

Program Element Output: Quantification of the health effects of human exposure to air pollutants, and documentation of the health benefits of environmental control. Program effort includes (1) developing additional, more sensitive health indicators; (2) surveying human populations to detect health effects resulting from pollutant exposure and; (3) expanding the number of pollutants to be studied, including sulfur oxides, nitrogen oxides, particulates, photochemical oxidants, trace metals, and synthetic organic toxic substances such as pesticides.

Program Element Director (PED):

Dr. John Knelson
Human Studies Laboratory
National Environmental Research Center
Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 549-8411

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-002	Grants for high priority new problem investigation.	Research Grant	103	Clayton
PEMP-003	Contract for epidemiology program evaluation.	Contract	103	Clayton

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PROGRAM ELEMENT NO. 1AA005 – COMMUNITY HEALTH EFFECTS SURVEILLANCE STUDIES (CHESS)

Research Objective Achievement Plan 21AYD: **National Environmental Specimen Banking System**

Objective: The establishment of a National repository for the storage of environmental specimens and the data gathered from such specimens. The specimens stored in this repository will serve as a continuous environmental monitoring system as well as providing a "flashback" alarm capability for newly emerging pollutant species.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYD-004	Collection and storage of selected samples for specimen bank.	Contract	103	Knelson

Research Objective Achievement Plan 21BCQ: **Community Health Effects Associated with Exposure to Trace Substances from Mobile and Stationary Sources**

Objective: Reports which define the tissue concentrations of toxic substances are related to environmental exposure; reports which relate exposure and tissue levels to the development of adverse effects; and reports which indicate the potential for adverse effects to occur at ambient levels of exposure.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BCQ-003	Development of more rapid and more accurate analytical techniques for trace metals using proton-induced x-ray fluorescence of mylar strip impact filters to monitor point-source emissions associated with waste water disposal methods.	Contract	103	Knelson
21BCQ-004	Develop analytical methods capable of establishing baseline levels of platinum and palladium.	Contract	103	Knelson

PROGRAM ELEMENT NO. 1AA005 – COMMUNITY HEALTH EFFECTS SURVEILLANCE STUDIES (CHESS)

Research Objective Achievement Plan 21BCQ

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BCQ-005	Collection of human tissue (autopsy maternal-fetal sets and deciduous teeth) in Los Angeles Basis prior to and following the introduction of catalytic converters – from high risk populations. Also, analysis of autopsy tissue and maternal-fetal sets in the Los Angeles Basin study for selected trace elements.	Contract	103	Knelson
21BCQ-006	Studies to determine the effects of long-term low level exposure of cadmium on blood levels of angiotensin in animals.	Contract	103	Knelson
21BCQ-007	Study the effects of selected trace metals, i.e., platinum, palladium, manganese and mercury, on behavior patterns, neurochemistry, neuropathology and neural development using animal models.	Contract	103	Knelson
21BCQ-033	Analyses of fossil fuels from newly developed sources to determine those trace substances with potentially future important impact on human health.	Contract	103	Knelson
21BCQ-035	Collection and analysis of data on trace substance levels and disease incidence in Japanese immigrants to California as related to known differences from disease rates in Japan.	Contract	103	Knelson

Research Objective Achievement Plan 21BKY: Clinical Studies of Exposure of Selected Environmental Pollutants Including Carbon Monoxide

Objective: Produce scientific manuscripts describing the human health effects of long-term or short-term exposure of populations to ambient levels of carbon monoxide. Information included will be obtained from selected high risk subgroups of the general population. As reports of in-house research, contracts or grants are completed, they will be provided to the Program Area Manager (PAM) and when acceptable published in scientific journals. Periodically, groups of related reports may be assembled for publication as EPA monographs.

PROGRAM ELEMENT NO. 1AA005 - COMMUNITY HEALTH EFFECTS SURVEILLANCE STUDIES (CHESS)

Research Objective Achievement Plan 21BKY

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BKY-006	Relative toxicity of the respirable fraction of TSP (sulfates and nitrates).	Contract	103	Knelson
21BKY-009	Effects of ozone and nitrogen dioxide on persons with chronic lung disease, compared to normals.	Contract	103	Knelson
21BKY-010	Effects of ozone and nitrogen dioxide on smokers compared to non-smokers.	Contract	103	Knelson
21BKY-012	Effects of controlled exposure to ozone and nitrogen dioxide on human immune responses.	Contract	103	Knelson
21BKY-014	Effects of controlled exposure to sulfates and nitrates on immune responses.	Contract	103	Knelson
21BKY-019	Effect of NO_2 and O_3 on human behavior and psychophysiology.	Contract	103	Knelson
21BKY-023	Effect of CO and altitude on human cardiovascular physiology.	Contract	103	Knelson
21BKY-027	Complete construction of CLEANS facility.	Contract	103	Knelson

Research Objective Achievement Plan 21BLD: **CHESS-Effects on Human Health Resulting from Community Exposure to Nitrogen Oxides, Photochemical Oxidants and Hydrocarbons (Mobile Sources)**

Objective: Produce scientific manuscripts describing the human health effects of long-term or short-term exposure of populations to ambient nitrogen oxides, photochemical oxidants, and hydrocarbon air pollutants. Information included will be obtained from selected high risk subgroups of the general population. As reports of in-house research, contracts or grants are completed, they will be provided to the Program Area Manager (PAM) and when acceptable published in scientific journals. Periodically, groups of related reports may be assembled for publication as EPA monographs.

PROGRAM ELEMENT NO. 1AA005 – COMMUNITY HEALTH EFFECTS SURVEILLANCE STUDIES (CHESS)

Research Objective Achievement Plan 21BLD

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BLD-002	CHESS NO_2 study area – collection of air monitoring and health indicator data.	Contract	103	Knelson
21BLD-009	Effects of exposure to oxidizing air pollutants to incidence of carcinogenic or mutagenic effects.	Research Grant	103	Knelson
21BLD-010	Effects of oxidizing air pollutants on respiratory disease.	Contract	103	Knelson
21BLD-011	Biochemical or metabolic alteration produced in response to NO_2 exposure.	Research Grant	103	Knelson
21BLD-015	Development of sensitive indicators of human response to exposure to NO_2 or the atmospheric transformation products of NO_2.	Contract	103	Knelson
21BLD-016	Development of estimates of prior exposure level in NO_2 study areas.	Contract	103	Knelson
21BLD-017	Effect of short-term exposure to indicated emergency levels of O_3.	Contract	103	Knelson
21BLD-018	Effects on humans of short-term exposure to high levels of O_3.	Contract	103	Knelson
21BLD-021	Characterization of human exposure to air pollution.	Contract	103	Knelson

PROGRAM ELEMENT NO. 1AA005 – COMMUNITY HEALTH EFFECTS SURVEILLANCE STUDIES (CHESS)

Research Objective Achievement Plan 21BLE: **CHESS-Effects on Human Health Resulting from Community Exposures to Sulfur Oxides and Particulates (Stationary Sources)**

Objective: Produce scientific manuscripts describing the human health effects of long-term or short-term exposure of populations to ambient sulfur oxides and particulate air pollutants. Information included will be obtained from selected high risk subgroups of the general population. As reports of in-house research, contracts or grants are completed, they will be provided to the Program Area Manager (PAM) and when acceptable published in scientific journals. Periodically, groups of related reports may be assembled for publication as EPA monographs.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BLE-007	Evaluation of the adequacy of air quality standards and significant harm levels.	Research Grant	103	Knelson
21BLE-009	Studies to determine the initial indications of effects of chronic exposure to sulfur oxides or its transformation products.	Contract	103	Knelson
21BLE-010	Development of estimations of prior pollution exposure in study areas.	Contract	103	Knelson
21BLE-011	Validation of CHESS system of administering questionnaires for ascertaining prevalence of CRD.	Contract	103	Knelson
21BLE-012	Study of asthma in relation to air pollution produced from a coal fired power plant.	Contract	103	Knelson
21BLE-013	Study of CRD in a major metropolitan area in relation to air pollution exposure.	Contract	103	Knelson
21BLE-014	Air Pollution Medical Research Conference – December 1974.	Research Grant	103	Knelson

PROGRAM ELEMENT NO. 1AA005 – COMMUNITY HEALTH EFFECTS SURVEILLANCE STUDIES (CHESS)

Research Objective Achievement Plan 21BLE

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BLE-023	Effects of exposure to selected particulates on incidence and severity of ARD – emphasis is placed on the physical and chemical properties of the particulates.	Research Grant	103	Knelson
21BLE-030	Estimation of population at risk at various levels of air pollution exposure.	Contract	103	Knelson

HEALTH EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1AA007 - BIOMEDICAL RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $ 50,000
Contracts: $1,155,000

Program Element Output: Generation of health effects information required for development and revision of criteria and standards pertaining to air pollutants. Program effort includes: (1) studies of pollutants acting singly or in combination with other pollutants or environmental factors; (2) assessment of pollutant effects upon accidental exposure victims, human volunteers, laboratory animals, isolated perfused organ systems and tissue cultures; (3) demonstration of possible adverse effects caused by carbon monoxide, odors, certain trace substances and acid mists; and (4) development of laboratory models to predict the impact of environmental pollution upon biologic systems.

Program Element Director (PED):

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PROGRAM ELEMENT NO. 1AA007 – BIOMEDICAL RESEARCH

Research Objective Achievement Plan 21AFK: Fuel and Fuel Additive Health Effects Research

Objective: Output from this ROAP is the development of scientific information needed to recommend catalyst/fuel programs for mobile sources that will assure the protection of public health and welfare and the necessary health intelligence required to develop control strategies for other fuels and fuel additives. The investigations are structured according to definitive toxicologic matrix and are designed to provide the following output: (a) Comprehensive data on overt effects of auto exhaust emission products resulting from the usage of oxidizing catalysts. Compounds to be tested are individual components or attrition products such as Sulfates, Pt, Pd, Ru, Al_2O_3, and whole emission products with or without catalysts (75%); (b) completion of bioeffect studies on manganese antiknock additive (MMT) (7–1/2%); (c) completion of pathological tissue assessment, data analysis and a final report on "The Chronic Study of Auto Exhaust in Beagles" (7–1/2%); (d) initiation of studies on interaction effects of high sulfur fuels and selected fuel additives; and a pilot study on characterization and potential toxic effects of diesel fuel and solid waste incineration emissions (10%).

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AFK-005	Biochemical interaction of organic constituents in fuel emissions with the functions of essential trace metals.	Contract	103	Stara
21AFK-006	Determine alterations in behavior of animals during and after exposure to toxic emission. Behavioral assessment of catalyst associated metal administration by inhalation, ingestion, and placental transfer.	Contract	103	Stara
21AFK-012	Effects of catalysts attrition products used in auto exhaust systems on fertility, fecundity, pre- and post-natal development, and neonatal survival.	Contract	103	Stara
21AFK-013	Determinations of effects of exposure to environmental pollutants on immune response test systems are utilized as a part of this task. (a) Sensitization potential of selected catalytic emission components. (b) Effect of catalytic emissions and/or selected components on immune competency.	Contract	103	Stara

Research Objective Achievement Plan 21AFK

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AFK-015	General pulmonary function testing of animals exposed to catalyst attrition products and total emissions with and without catalyst. Parameters include, e.g., diffusion, lung volumes, nitrogen washout, resistance, closing pressures.	Contract	103	Stara

Research Objective Achievement Plan 21AYF: Pulmonary and Systemic Effects Resulting from Gaseous and Particulate Air Pollutants: Singly and in Combination

Objective: Data for predicting potential health hazards to man from exposure to regulated and non-regulated air pollutants, both singly and in combination with one another and with toxicological and physical agents. These data, essential for establishment of a definitive scientific basis for ambient air standards, will be presented in the form of progress reports for intramural needs and as publications in the open literature.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYF-003	Interaction of various pollutants on causation of pulmonary disease. Initial studies will be on interaction effects of low levels of NO_2, SO_2, particulates on resistance to bacterial and viral infection and immune defense mechanisms.	Contract	103	Garner
21AYF-004	Examination of the effects of air pollutants on pulmonary macrophage by scanning electron microscopy. Initial studies will be on dose/response effects of O_3, NO_2, SO_2.	Contract	103	Garner
21AYF-005	Effect of air pollutants on respiratory mucosa using combinations of O_3 and NO_2. Studies are centered on formation of ozonide, etc.	Contract	103	Garner

PROGRAM ELEMENT NO. 1AA007 – BIOMEDICAL RESEARCH
Research Objective Achievement Plan 21AYF

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYF-008	Teratogenic effects and effects on growth and development, including cardiovascular function, of prenatal and neonatal exposure of non-human primates to CO, O_3, NO_2.	Contract	103	Garner
21AYF-018	Determine relative irritant potency of (a) particulates resulting from oxidation of sulfur oxide (b) inert particles interacting with sulfur oxide.	Research Grant	103	Garner
21AYF-019	Determine effect of interaction of oxidant and sulfate on production of lung lesions. Initial studies will be on effects of O_3/SO_2, O_3/SO_4 or O_3/NaCl together with physical agents on collagen, gross enlargement of lungs, development of emphysema, etc.	Contract	103	Garner
21AYF-021	Effects of atmospheric pollutants on carcinogenesis. Initial studies will be of carcinogenic effects in hamsters of ammonium sulfate and manganese dioxide administered with benzo(a)pyrene.	Research Grant	103	Garner
21AYF-022	Determine the role of fine particulates found in ambient air as co-factors in pulmonary carcinogenesis. Particulates collected from ambient air will be administered intratracheally to hamsters with benzo(a)pyrene.	Contract	103	Garner
21AYF-027	Exposure of tissue culture systems to air pollutants: (a) Develop tissue culture system that will imitate surface cell layers at risk from airborne pollutants, e.g., conjunctiva, epithelial cells of respiratory tract. (b) Use this system as toxicological screen for selected pollutants.	Contract	103	Garner
21AYF-028	Analytical chemistry support for isolated test systems.	Contract	103	Garner

PROGRAM ELEMENT NO. 1AA007 - BIOMEDICAL RESEARCH

Research Objective Achievement Plan 21AYF

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYF-030	*In vitro* cytotoxicity screen (rabbit alveolar macrophage). To provide extension of in-house capability for screening and validation through *in vivo* studies.	Contract	103	Garner
21AYF-033	Biometry support for Experimental Biology Laboratory.	Contract	103	Garner

Research Objective Achievement Plan 21BCT: Toxicology of Environmental Trace Metals

Objective: Output from this ROAP will provide background health intelligence which will be utilized in developing rational control strategies. The studies on trace metals are structured to provide the following output: (1) contribution of different routes of exposure to body burden; (2) the influence of age, diet, stress factors, and chemical form upon absorption, distribution and retention; (3) determination of modes of excretion, critical storage organs, and possible biological effects in the most sensitive segments of the population.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BCT-006	Determine potential teratogenicity and/or embryo toxicity of certain trace metal substances and environmental samples. (a) Lead, cadmium (b) Palladium, ruthenium (c) Environmental samples	Contract	103	Stara

HEALTH EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1BA019 - WATER QUALITY HEALTH EFFECTS RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $570,000

Program Element Output: (1) Health-related criteria for promulgating water quality standards for fresh and marine recreational waters. This includes determining the correlation between diseases among swimmers and the various indices of pollution in recreational waters. (2) Health-related criteria for the safe treatment and disposal of wastewaters and sludges. This includes an assessment of the potential health hazards associated with the use of land for wastewater and sludge treatment and disposal.

Program Element Director (PED):

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Research Objective Achievement Plan 21BFL: **Health Effects Related to Wastewater and Sludge Treatment and Disposal**

Objective: Research reports providing scientific data needed to prepare criteria documents in health effects associated with municipal wastewater treatment plants and use of effluent and sludges for agriculture and land disposal.

PROGRAM ELEMENT NO. 1BA019 – WATER QUALITY HEALTH EFFECTS RESEARCH
Research Objective Achievement Plan 21BFL

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BFL-001	Define morbidity associated with pathogens and toxic chemicals in aerosols from municipal wastewater treatment plants.	Contract	140b	Knelson
21BFL-002	Microbiologic and chemical content of land to which sewage sludge is to be applied and changes in these factors subsequent to application including fate and survival of microorganisms and transport of metals through soil. Determination of human risk associated with the process.	Contract	140b	Knelson
21BFL-003	Microbiologic and chemical characteristics of land to which aerosol applications of waste water are to be applied, and changes in these factors subsequent to application including aerosolization of microorganisms or trace metals, fate and survival of microorganisms and transport of metals through the air and soil. Determination of human risk associated with the process.	Contract	140b	Knelson

HEALTH EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1CA046 - WATER SUPPLY HEALTH EFFECTS RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $376,000
Contracts: $972,000

Program Element Output: Development of valid criteria for promulgating drinking water standards. Research effort includes studies of biological effects of infectious agents and potentially toxic contaminants in the water environment.

Program Element Director (PED):

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Research Objective Achievement Plan 21APV: **Occurrence and Effects of Organic Contaminants in Drinking Water**

Objective: The results of these investigations will permit the establishment of interim standards based on adverse biological effects in experimental animals and epidemiological concurrence on the hazard or safety of these agents to man. In addition, these studies will be applicable to the evaluation of potential health hazards from direct reuse of waste water.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21APV-005	Application of concentration and recovery techniques to concentration of organics from five additional water supplies. The organics from five supplies other than the model supply will be concentrated for chemical characterization and toxicity testing. Concentrates from supplies one through six will be used for toxicity screening tests. Two of these supplies providing the highest toxicity of the concentrates will be used to concentrate higher quantities of organics for subchronic toxicity testing.	Contract	104b	Robeck

PROGRAM ELEMENT NO. 1CA046 – WATER SUPPLY HEALTH EFFECTS RESEARCH
Research Objective Achievement Plan 21APV

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21APV-014	Assessment of the effects of halogenated aromatic hydrocarbons on the metabolism of foreign organic compounds. These compounds have a high potential for chronic toxicity and may alter detoxication processes such that they synergize the toxicity of other organic compounds.	Research Grant	104b	Robeck
21APV-017	Retrospective epidemiologic study of the occurrence of organics in tap water and reproductive performance of rat breeders in laboratory animal supply houses.	Contract	104b	Robeck
21APV-024	Assessment of subchronic oral toxicity of bis (2-chloroethyl) ether in rats and dogs. This compound is present in some water supplies particularly those using surface water from an industrial origin as the source of tap water. This compound is potentially highly toxic with either short or protracted exposures via the oral route.	Contract	104b	Robeck
21APV-025	Scientific summary of one class of organic compounds.	Contract	104b	Robeck

Research Objective Achievement Plan 21APW: Occurrence and Effects of Inorganic Contaminants of Drinking Water

Objective: A better scientific base will be provided to enable the setting of limits for inorganic contaminants not presently contained in the Drinking Water Standards and revision of current limits not based on sound health effects data. Health effects data will be obtained for the following contaminants noted in the Environmental Research Objective Statement (EROS): arsenic, barium, nitrates, radioactivity, selenium, antimony, asbestos, cobalt, molybdenum, nickel, silicates, tin and vanadium. By FY 75, proposed drinking water standards for inorganic contaminants will be defensible with the additional toxicological data provided for barium, the weakest standard at present.

PROGRAM ELEMENT NO. 1CA046 – WATER SUPPLY HEALTH EFFECTS RESEARCH
Research Objective Achievement Plan 21APW

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21APW-022	Determine human body burden of geological contaminants (arsenic and selenium) in areas of occurrence in drinking water.	Contract	104b	Robeck
21APW-024	Use of proton-induced X-ray fluoresence to analyze samples.	Contract	104b	Robeck
21APW-025	Study the physiological availability of selected inorganics in water as compared to availability in food stuffs.	Contract	104b	Robeck
21APW-027	Study patterns of water consumption.	Contract	104b	Robeck
21APW-035	Localization of asbestos fibers by autoradiography.	Contract	104b	Robeck
21APW-043	Analytical support required for central nervous system toxicity studies.	Contract	104b	Robeck
21APW-045	Analyze household dust samples in Boston.	Contract	104b	Robeck
21APW-048	Epidemiologic study of health effects in areas where barium exceeds the present Drinking Water Standard of 1.0 mg/liter.	Research Grant	104b	Robeck
21APW-049	Determine the range between nutritionally adequate selenium and exposures that show evidence of toxicity.	Contract	104b	Robeck
21APW-050	Determine health effects data and prepare criteria document recommending a drinking water standard for molybdenum.	Research Grant	104b	Robeck
21APW-051	Determine health effects data and prepare criteria document recommending a drinking water standard for *antimony*.	Contract	104b	Robeck
21APW-056	Lead body burden in growing children.	Contract	104b	Robeck

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PROGRAM ELEMENT NO. 1CA046 – WATER SUPPLY HEALTH EFFECTS RESEARCH
Research Objective Achievement Plan 21APW

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21APW-075	Prepare scientific summaries on various inorganic contaminants regarding their occurrence and the analysis of data from completed toxicological and epidemiological studies.	Contract	104b	Robeck

Research Objective Achievement Plan 21APX: **Microbiological Contaminants of Water Supplies – Occurrence and Effects**

Objective: A balanced research approach will determine if pathogens occur in drinking water and corroborative epidemiological studies will elucidate the significance of such findings. Research results will be used to develop new criteria, particularly for viruses, for changes in drinking water standards and possible changes in water supply treatment practices. Technical reports, manuals, etc. will be be prepared and presented to health, engineering and water supply associations so that treatment processes can be upgraded.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21APX-006	Study on human health and water quality.	Contract	104b	Robeck
21APX-014	Identification, isolation and characterization of Infectious Hepatitis (Hepatitis A) Agent.	Research Grant	104b	Robeck

Research Objective Achievement Plan 21BJS: **Investigations of the Carcinogenic Potential of Asbestiform Fibers in Experimental Animals and Man**

Objective: To financially support, in conjunction with Department of Health Education and Welfare, a multi-species chronic feeding study using four asbestos fiber types to determine relative risk from oral exposure. To initiate studies aimed at the elucidation of mechanism(s) of action of asbestiform fibers in the production of neoplastic lesions. To determine the extent to which the incidence of human carcinomas correlate with the occurrence of asbestiform fibers in tap water.

PROGRAM ELEMENT NO. 1CA046 – WATER SUPPLY HEALTH EFFECTS RESEARCH
Research Objective Achievement Plan 21BJS

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BJS-001	Study of the morphological and biochemical changes involved with neoplastic alterations in *in vitro* systems as a result of challenge with asbestiform fibers of varying dimensions.	Research Grant	104b	Robeck
21BJS-003	Study of the morphological and biochemical changes involved with neoplastic alterations in *in vitro* systems as the result of challenge with asbestiform environmental fibers alone and in combination with chemical environmental carcinogens.	Contract	104b	Robeck

Research Objective Achievement Plan 51ASB: Health Effects Associated with Consumption of Renovated Water

Objective: Report on the research needed to determine the suitability of reusing treated waste water for drinking purposes. Report on water quality needed for recycling at poultry processing plants.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
51ASB-002	Collection of organic chemicals from reuse product water.	Contract	104b	Robeck
51ASB-003	Identification of organics collected from reuse product water.	Contract	104b	Robeck
51ASB-006	Evaluation of toxicity testing techniques.	Research Grant	104b	Robeck
51ASB-007	Comparison of inorganic contaminants in currently used drinking water and AWT pilot plant effluents.	Contract	104b	Robeck
51ASB-011	Test AWT pilot plant effluents for pyrogenic activity.	Contract	104b	Robeck

HEALTH EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1CB047 – WATER SUPPLY CONTROL TECHNOLOGY

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $450,000
Contracts: NONE

Program Element Output: New or improved technology for the effective and economical control of drinking water contaminants during storage, treatment, and distribution. Program efforts will be directed to demonstrate technologies for removal of infectious agents, potentially toxic or aesthetically displeasing contaminants so that municipal sectors will be able to achieve compliance with present and future water quality standards. Improved methods of operating both new and existing water supply facilities will be developed and demonstrated.

Program Element Director (PED):

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Research Objective Achievement Plan 21AQB: **Removal and Control of Physical and Chemical Contaminants of Drinking Water**

Objective: Develop information for manual of practice for the removal and control of the physical and chemical contaminants of drinking water to be used by Water Supply Division and Office of Enforcement and General Counsel, EPA, State Health Agencies and the Water Supply Industry. Manual will cover treatment technology for the removal of organics and inorganics and for the prevention of water quality deterioration during distribution.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AQB-006	Regeneration technique for nitrate removal ion exchange resins.	Research Grant	104b	Robeck
21AQB-007	Treatment for the removal of Ra_{226} during water treatment.	Research Grant	104b	Robeck
21AQB-008	Development of maintenance-free treatment system for small water supplies.	Research Grant	104b	Robeck
21AQB-016	Analysis of laboratory and field organic removal projects.	Research Grant	104b	Robeck

PROGRAM ELEMENT NO. 1CB047 – WATER SUPPLY CONTROL TECHNOLOGY
Research Objective Achievement Plan 21AQB

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AQB-019	Competitive adsorption of organics on activated carbon.	Research Grant	104b	Robeck

Research Objective Achievement Plan 21AQE: Removal or Inactivation of Microbiological Contaminants of Drinking Water

Objective: Develop information for a manual of practice for efficient disinfection of drinking water to meet microbiological water quality standards. Report will define influences of important water treatment parameters on disinfection methods and provide disinfection practices in relation to these parameters.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AQE-004	Investigation of use of microorganisms other than coliforms as indicators of virus disinfection in drinking water.	Research Grant	104b	Robeck
21AQE-005	Study of chlorine sensitivity differences on selected viruses in surface waters used for drinking water supplies.	Research Grant	104b	Robeck
21AQE-017	Reliability and significance of free and other residual chlorine determination.	Research Grant	104b	Robeck

HEALTH EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1DA313 – ENVIRONMENTAL EFFECTS RESEARCH

Funds: No new extramural Tasks which are planned for funding in the current Fiscal Year.

Program Element Output: Identification of the major effects of storing, collecting, transporting, processing and disposing of solid wastes on man, animals, aquatic life, plants, materials and the environment.

Program Element Director (PED):

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PROGRAM ELEMENT NO. 1EA078 – PESTICIDES HEALTH EFFECTS RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $270,000

Program Element Output: An evaluation of the acute and chronic health hazards from human exposure to pesticides, their residues and their metabolites. This program is concerned with identification of pesticide metabolites; and evaluation of pesticides effects upon normal biological functions. Indices of effects include mortality, growth rate, clinical signs of poisoning, hematologic factors and reproduction. The scope of these investigations ranges from laboratory studies of animals and exposed humans to community epidemiologic projects.

Program Element Director (PED):

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Research Objective Achievement Plan 21BEF: Toxicology of High Priority Chlorinated Hydrocarbon Pesticides

Objective: Provide information and data to OPP on the eight classes of chlorinated hydrocarbon pesticides in relation to reproduction, teratology, carcinogenesis, tissue distribution and accumulation and pharmacodynamics as needed.

PROGRAM ELEMENT NO. 1EA078 – PESTICIDES HEALTH EFFECTS RESEARCH

Research Objective Achievement Plan 21BEF

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BEF-020	NMR – Pesticide interaction.	Contract	20	Durham
21BEF-021	Radioimmunoassay.	Contract	20	Durham

Research Objective Achievement Plan 21BEH: **Development of Techniques for Safety Evaluation of Insect Pathogens**

Objective: Develop techniques for evaluating the safety to human populations of insect pathogens (viruses, fungi, bacteria and protozoa).

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BEH-007	Toxicologic hazard of bacillus used as insect pathogens in pest control.	Contract	20	Durham
21BEH-008	Development of an imminological assay for monitoring levels of insect pathogens.	Contract	20	Durham

HEALTH EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1EA486 – HEALTH EFFECTS OF SUBSTITUTE PESTICIDE CHEMICALS

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $660,000

Program Element Output: Toxicity information on chemical substances which are being considered by EPA as substitutes for pesticides in current use. This information, which is needed to assess human health effects, is obtained in part, by exposing several mammalian species to acute and sub-acute levels of these substitute chemicals via inhalation, oral, and dermal routes. Toxicity information includes but is not limited to measurements of lethal dose, distribution of compounds and their metabolites in body tissues, gross and microscopic anatomical effects, blood chemistry, reproductive performance and teratology. The mutagenic properties of the compounds are measured in bacterial, insect and mammalian systems and in human cell culture.

Program Element Director (PED):

Dr. William F. Durham
Pesticides & Toxic Substances Effects Lab
National Environmental Research Center
Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 549–8411

Research Objective Achievement Plan 21BLB: Teratogenic, Carcinogenic and Mutagenic Effects of Substitute Chemical Pesticides

Objective: Research reports of laboratory tests of the potential for selected pesticides to cause teratogenic, carcinogenic and mutogenic effects in man. The compounds to be tested and the specific tests necessary for each compound will be chosen by the review procedure established by the Office of Pesticide Programs. Studies of acute effects at low incidence levels will also be performed.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BLB-001	Mutagenesis studies of pesticides compounds, using mammalian fibroblast cell culture, dominant lethal tests, and microorganisms.	Contract	20	Clayton
21BLB-002	Mutagenesis screening of pesticides using Drosophila systems.	Contract	20	Clayton
21BLB-003	Teratogenesis screening of pesticides.	Contract	20	Clayton

PROGRAM ELEMENT NO. 1EA486 – HEALTH EFFECTS OF SUBSTITUTE PESTICIDE CHEMICALS

Research Objective Achievement Plan 21BLB

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BLB-004	Correlation of carcinogenicity of pesticides with several mutagenesis tests.	Contract	20	Clayton

PROGRAM ELEMENT NO. 1FA081 – RADIATION EPIDEMIOLOGICAL RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $45,000
Contracts: See RFP when issued

Program Element Output: Qualification by epidemiologic studies of man's risk of developing various diseases due to exposure to radiation. Program efforts will be directed specifically to evaluate: (1) the development of neoplasms of all organ sites of Japanese atomic bomb survivors; (2) the development of thyroid neoplasms in young adults who, as children, received diagnostic doses of 131I; and (3) the development of lung malignancies in patients who have body burdens of thorium dioxide and are continuously exhaling thoron.

Program Element Director (PED):

Dr. John Knelson
Human Studies Laboratory
National Environmental Research Center
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Research Objective Achievement Plan 21ALX: Human Studies of Radiation Effects by Epidemiologic Methods

Objective: Technical reports describing (1) Health experience of atomic bomb survivors and their progency; (2) Dose-response curve of thyroid neoplasia following exposure to diagnostic levels of radioiodine; (3) Relationship of congential anomalies to parental exposure to radar; (4) Behavioral effects of chronic low-level microwave exposures.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ALX-011	Define indicators for neurophysiologic, behavioral, and performance responses resulting from exposure to non-ionizing radiation.	Research Grant	301	Knelson

PROGRAM ELEMENT NO. 1FA081 – RADIATION EPIDEMIOLOGICAL RESEARCH

Research Objective Achievement Plan 21ALX

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ALX-013	Test on selected population groups exposed to non-ionizing radiation for neurophysiologic, behavioral and performance responses across a gradient of exposure.	Contract	301	Knelson

PROGRAM ELEMENT NO. 1FA082 – RADIATION HEALTH EFFECTS RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $30,000
Contracts: See RFP when issued

Program Element Output: Definition of the health effects in man resulting from exposure to radiation in order to provide the scientific base for development of generally applicable environmental standards. This program includes investigations of effects of specific radionuclides, and evaluation of the interactions between ionizing radiation and other biological, chemical, and physical environmental pollutants.

Program Element Director ((PED):

Dr. R. John Garner
Experimental Biology Laboratory
National Environmental Research Center
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Mr. George B. Morgan
Monitoring Systems Research & Development Lab
Environmental Protection Agency
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Las Vegas, NV 89114
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ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-003	Conference Support – International Congress of Radiation.	Research Grant	301	Clayton

PROGRAM ELEMENT NO. 1FA082 – RADIATION HEALTH EFFECTS RESEARCH

Research Objective Achievement Plan 21AME: **Biological Effects of Non-Ionizing Electromagnetic Radiation**

Objective: Data relevant to establishment of new or support of existing primary standards. Data will be presented as progress reports for intramural needs and as publications in the open literature.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AME-004	Provide cytogenetic analysis to support in-house effort to determine effects of exposure of Chinese hamsters to EM radiation in the RF and radar frequency range. (a) On chromosome anomalies in circulating lymphocytes. (b) By subsequent mating, on reproductive function, viability of offspring, and induction of developmental defects and transmissible chromosome anomalies.	Contract	301	Garner

Research Objective Achievement Plan 21BAH: **Radiotoxicology of Tritium**

Objective: Research reports covering: (a) Effects of Lifetime Parental Exposure to Tritium on the F_2 Generation; (b) Effects of developing nervous system of continuous exposure to HTO during gestation; (c) Tumorigenic and life span shortening effects of chronic exposure to HTO; (d) Radiation effects on pre-implantation embryos; (e) Identification of critical sub-populations for chronic HTO exposure; (f) Histochemical studies of the effects of HTO on reproductive system; (g) Metabolism of organically bound tritium; (h) Genetic effects of HTO *in vitro*.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BAH-011	Teratologic effects on rabbits of continuous exposure *in utero*.	Research Grant	301	Garner

HEALTH EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1GA085 – NOISE HEALTH EFFECTS RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $ 40,000
Contracts: $260,000

Program Element Output: The objective is to quantify the health effects of exposure to environmental noise, and to provide health effects information required for the establishment and revision of criteria and standards related to noise exposures. Research effort includes: environmental noise measurements and exposure determinations; physiological and psychological responses and effects (auditory and non-auditory) on humans and animals to environmental noise; and coordination of noise health effects research between EPA and other Federal governmental agencies.

Program Element Director (PED):

Dr. John Knelson
Human Studies Laboratory
National Environmental Research Center
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Telephone: (919) 549-8411

Research Objective Achievement Plan 21AYK: Health Impact of Environmental Noise

Objective: Data and information for evaluation of health effects for defending and/or revising existing criteria, or establishment of acceptable noise levels.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYK-002	Measurement of environmental noise in the community and associated human responses.	Contract	14	Clayton
21AYK-003	Determine non-auditory system adaptation effects to long-term repetitive and varying noise.	Contract	14	Clayton
21AYK-005	The effects of environmental noise on Hearing-Critical Issues (Symposium).	Research Grant	14	Clayton
21AYK-006	Study auditory and non-auditory effects of long exposures to low-levels of steady state and intermittent noise.	Research Grant	14	Clayton

PROGRAM ELEMENT NO. 1GA085 – NOISE HEALTH EFFECTS RESEARCH

Research Objective Achievement Plan 21AYK

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYK-007	Determine improved criteria for verbal communication, including schools, home and laboratory.	Contract	14	Clayton

PROGRAM ELEMENT NO. 1HA092 – NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH

Funds: No new extramural Tasks which are planned for funding in the current Fiscal Year.

Program Element Output: Evaluation of the impact of low level chronic exposures of man to environmental pollutants, with particular emphasis upon possible carcinogenic, mutagenic and/or teratogenic effects. Initial effort will involve laboratory animals but with emphasis upon the ability to extrapolate these data to man.

Program Element Director (PED):

Mr. J. Wesley Clayton
Health Effects Division (RD-683)
Office of Research and Development
Environmental Protection Agency
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Washington, DC 20460
Telephone: (202) 755-0614

PROGRAM ELEMENT NO. 1LA426 – TOXIC SUBSTANCES HEALTH EFFECTS RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $210,000

Program Element Output: (1) Mammalian toxicity information on toxic substances which are candidates for regulation by EPA. This information is needed to assess the potential human health hazards of toxic substances. The chemicals of interest are mainly organic and inorganic compounds associated with chemical manufacturing and waste disposal. (2) A system of toxicity tests for screening a large number of potentially toxic compounds, using an optimum combination of *in vivo* and *in vitro* test systems as primary and secondary screens.

Program Element Director (PED):

Dr. William F. Durham
Pesticides & Toxic Substances Effects Lab
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Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone (919) 549-8411

PROGRAM ELEMENT NO. 1LA426 – TOXIC SUBSTANCES HEALTH EFFECTS RESEARCH

Research Objective Achievement Plan 21BBE: Toxicity of Environmental Chemicals

Objective: Reports will be submitted to OTS providing data on the effects of various toxic substances on laboratory animals. These data will provide information relating to the development of a predictive model of structure-activity relationship and will be useful in classifying the toxicity of a wide variety of chemicals. It will also provide a spectrum of data on mammalian toxicity of various toxic substances including trace metals and contaminants.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BBE-005	Multigeneration Study with pure HCB (a) Phase out of multigeneration Study with old HCB. (b) Milk Analysis vs. time of exposure to HCB.	Contract	301	Durham

Research Objective Achievement Plan 21BDO: Development of Toxicity Screening Methods for Toxic Substances

Objective: A series of reports will be prepared recommending a system of toxicity tests for screening a large number of potentially toxic compounds.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BDO-004	Assessment of cytogenetic and cytotoxic changes *in vitro* cell culture systems induced by trace metals and synthetic organics.	Contract	301	Durham
21BDO-005	Development of isolated embryo screening techniques to assess early effects of trace metals and synthetic organics on mammalian embryogenesis.	Contract	301	Durham
21BDO-008	Neurotoxicity screening method for toxic substances.	Contract	301	Durham

HEALTH EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. XF1106 – AEC RADIATION EFFECTS PROGRAM

Funds: No new extramural Tasks which are planned for funding in the current Fiscal Year.

Program Element Output: Determination, by means of laboratory and field investigations of the potential hazard to humans and the environment resulting from nuclear testing activities. The establishment of testing criteria and radiation protection standards requires an understanding of the behavior of selected radionuclides in man's food chain and the environment. In this study emphasis will be placed on radionuclide metabolism in plants and animals, soil to plant relationship, and the transport, distribution and exchange within and between these components.

Program Element Director (PED):

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ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

The ecological processes and effects research area is responsible for determining the effects of air and water pollutants on the structure and function of ecosystems and on biotic and abiotic subcomponents of these ecosystems. One major objective of the program is to develop scientific information necessary for water quality criteria and secondary air quality criteria.

Programs on aquatic systems are conducted to determine the effects of pollutants such as temperature, pesticides and heavy metals on fresh and marine water fish, invertebrates and their food chain organisms. Acute and chronic effects of pollutants on life stages of the organisms are determined.

Investigations of the effects of major air pollutants on crops and vegetation are conducted to provide information for establishing secondary ambient air quality standards. Specific studies of the effects of NO_x, SO_x, hydrocarbons, and oxidants are conducted on representative terrestrial ecosystems.

Also included are studies of alternative methods of pest control. These efforts are aimed at the reduction of dependence upon persistent chemical pesticides. Non-chemical methods of pest control with great specificity on target organisms and little or no effects on non-target organisms are sought.

A second major objective of this program area is to determine a chemical, physical and biological process associated with sources, pathways, persistences, and fates of pollutants in ecosystems. The results of these studies along with results from effects and other research areas provide the scientific and technical basis for control and abatement actions.

Program Area Manager (PAM):

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Ecological Processes and Effects Division (RD-682)
Office of Research and Development
Environmental Protection Agency
Waterside Mall
Washington, DC 20460
Telephone: (202) 426-2511

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1AA002 – FUEL AND FUEL ADDITIVE REGISTRATIONS

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $930,000

Program Element Output: Registration of all fuels and fuel additives. Program efforts will be to: (1) provide standardized test procedures needed for emission characterization; (2) provide an independently derived information base on the types and amounts of metals; non-metal, and organics present in fuels and fuel additives; (3) assess the effects of fuel and related exhaust emissions on human health and public welfare, emission control devices, and visibility; (4) determine fuel emission contributions to total atmospheric pollutant loading; and (5) recommend, as warranted, candidates for regulation.

Program Element Director (PED):

Mr. John Moran
Source Emmissions Measurements Branch
National Environmental Research Center
Environmental Protection Agency
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Telephone: (919) 549-8411

Research Objective Achievement Plan 21BCE: **Health and Welfare Impact of Catalysts used in the Control of Mobile Sources of Air Pollutants**

Objective: Annual report assessing the health and welfare impact of catalysts used in the control of mobile source emissions. Characterization of regulated and nonregulated emissions from catalyst-equipped, vehicles, validation of diffusion models, estimate and measure incremental exposures to and assess public health and welfare impact of such catalyst specific emissions.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BCE-001	Survey gaseous and particulate emissions—California 1975 model year vehicles.	Contract	103	Moran
21BCE-006	Compare relative toxicities against Pb compounds using *in vitro* macrophage system. (a) of Pt-group compounds. (b) of base metal compounds.	Contract	103	Moran

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PROGRAM ELEMENT NO. 1AA002 – FUEL AND FUEL ADDITIVE REGISTRATIONS

Research Objective Achievement Plan 21BCE

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BCE-007	Compare relative toxicities against Pb compounds using *in vitro* conjunctival cell and respiratory epithelial cell cultures. (a) of Pt-group compounds.	Contract	103	Moran
21BCE-010	Compare relative mutagenicity against Pb compounds using host-mediated assay system. (a) of Pt-group compounds. (b) of base metal compounds.	Contract	103	Moran

Research Objective Achievement Plan 26AAE: Development of Information for Fuel and Fuel Additives Control or Prohibition

Objective: Registration of designated fuels and fuel additives. Protocols to assess the effect of fuel components and additives on emission products, control device performance, atmospheric loading and transformations, health effects, and ecological effects. Resulting information will allow the control or prohibition of fuel components and/or additives pursuant to Section 211 of the 1970 Amendments in a time frame to assure public safety and satisfactory performance of advanced automotive control systems.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAE-017	Characterize particulate emissions—alternate power systems (rotary). Develop protocol.	Contract	103	Moran
26AAE-019	Characterize diesel gaseous and particulate emissions.	Contract	103	Moran

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1AA003 – REGIONAL AIR POLLUTION STUDY

Funds: Available as of July 1, 1974 for support of listed Tasks:

Grants:	NONE
Contracts:	$825,000

Program Element Output: Analysis of the transport and dispersion process over a large geographical region associated with stable and reactive air pollutants emanating from a multitude and variety of sources. Program efforts will be to: (1) obtain an improved understanding of the atmospheric reactions associated with SO_2, NO_x, hydrocarbons, ozone, organic nitrates, and aldehydes; (2) define an optimum meteorological measurements network for a Region; (3) evaluate the representativeness of meteorological measurements required for diffusion modeling and control strategies; and (4) test independently developed air quality and environmental models.

Program Element Director (PED):

Dr. Jack E. Thompson
Office of the Director
National Environmental Research Center
Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 549–8411

Research Objective Achievement Plan 26AAI: Regional Air Pollution Study (RAPS)

Objective: (1) A spectrum of regional and local-scale air quality simulation models for all of the criteria pollutants plus sulfates, nitrates and selected aerosols (e.g., fine particles) which are validated against the data collected in the field in St. Louis; (2) Subsidiary meteorological and chemical mathematical models needed as inputs to the AQSM of item (1); (3) Models capable of predicting analytically the atmospheric effects of pollutants as functions of pollutant levels, urban structure and heat emissions; (4) A comprehensive data bank and data management system for storage and retrieval of data collected in the RAPS program; (5) A comprehensive, quantitative description of the pollutants, regulated and non-regulated, in the St. Louis atmosphere.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAI-134	Development of measurement techniques for NH_3 and SO_2 by open path techniques in support of Plume Dispersion Studies. The measurements will be used to compare results with long path laser point monitors and relate results to dispersion calculations.	Contract	103	Thompson

PROGRAM ELEMENT NO. 1AA003 – REGIONAL AIR POLLUTION STUDY
Research Objective Achievement Plan 26AAI

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAI-215	Kinetic Model Verification. Carry out smog chamber experiments for the purpose of gathering accurate and detailed data to aid in the development and validation of photochemical models to assess air quality.	Research Grant	103	Thompson
26AAI-222	Analytical Support for Aerosol Studies: Chemical analysis of St. Louis aerosols for sulfate, nitrate, ammonium, organic and carbon-hydrogen-nitrogen.	Contract	103	Thompson
26AAI-223	Aircraft Support for Aerosol Study. Measurements in power plant plumes and in the urban plume to determine aerosol growth laws and transformations and sinks of aerosol precursors gases.	Contract	103	Thompson
26AAI-230	Aerosol Spatial Distribution: Local support and coordination for aerosol field studies in St. Louis, effects of relative humidity changes on visibility, augmentation of existing networks (City, County, RAMS) with special aerosol instruments and collectors, interpretation of ground and aircraft data in terms of aerosol growth laws and transformations and sinks of aerosol precursors.	Research Grant	103	Thompson
26AAI-329	Provide a data management system for St. Louis data.	Contract	103	Thompson
26AAI-330	Development of an objective analysis scheme to meet the meteorological requirements of the RAPS air quality simulation models.	Contract	103	Thompson
26AAI-410	Emissions inventory design, collection and testing.	Contract	103	Thompson
26AAI-505	Preliminary checkout and model demonstrations using available met model and emission control cost data or simulated data.	Contract	103	Thompson

PROGRAM ELEMENT NO. 1AA003 – REGIONAL AIR POLLUTION STUDY

Research Objective Achievement Plan 26AAI

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAI-506	Determine by surveys the damages (costs) to people other than direct health costs, to avoid or live with air pollution, i.e., cost of extra housing moves, pollution avoidance devices, (air conditions) restricted social activities.	Contract	103	Thompson
26AAI-507	Determine by surveys of firms, park administrators, nurserymen and farmers the economic losses of vegetation due to air pollution.	Contract	103	Thompson

PROGRAM ELEMENT NO. 1AA006 – ECOLOGICAL IMPACT OF AIR POLLUTION

Funds: Available as of July 1, 1974 for support of listed Tasks:

Grants:	$197,000
Contracts:	$180,000

Program Element Output: (1) Determination of the effects of air pollutants on biotic (crops, vegetation, domestic animals, and wildlife) and abiotic (soil, water, major natural and man-made materials) components of the environment; (2) Assessment of the effectiveness of control measures through monitoring of selected ecosystems such as urban oxidant complexes, fossil fuel combustion emission complexes, fluoride emission complexes and hydrocarbon emission complexes; in order to provide a better understanding upon which to base realistic control efforts through the setting of secondary ambient air quality standards and other control measures.

Program Element Director (PED):

Dr. Norman Glass
National Ecological Research Lab
National Environmental Research Center
Environmental Protection Agency
200 S.W. 35th Street
Corvallis, OR 97330
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Research Objective Achievement Plan 21ALR: **Strengthening Scientific Basis for Secondary Air Quality Standards and Control of Other Pollutants**

Objective: A series of research reports on the effects of selected pollutants on specific plant and animal receptors. Summary reports for each pollutant will be prepared recommending levels of pollutants, based on data obtained that will not adversely affect plant and animal communities. These levels will help strengthen the scientific basis for air quality standards and control of other pollutants.

PROGRAM ELEMENT NO. 1AA006 - ECOLOGICAL IMPACT OF AIR POLLUTION

Research Objective Achievement Plan 21ALR

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ALR-026	Develop and maintain assessment of vegetation damage function for economic tradeoff analyses.	Contract	103	Glass
21ALR-028	Grant to study biotransformations of SO_x and C_2H_4 in higher plants and microbiota.	Research Grant	103	Glass

Research Objective Achievement Plan 21ALU: Predictive Modeling of the Impact of Air Pollutants on Selected Terrestrial Ecosystems

Objective: A series of research reports on the modeling and experimental compartments of the program. This will include experimental data and predictive models for pollutant impact on biomass population dynamics, succession and transport processes.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ALU-012	Development of biomathematical techniques involving mathematics, statistics, and computer programming required for development, implementation and validation of inhouse models.	Research Grant	103	Glass
21ALU-021	To develop and implement mathematical and statistical techniques required for model development and validation.	Research Grant	103	Glass
21ALU-040	Technical services contract for operation and maintenance of the National Ecological Research Lab (NERL).	Contract	103	Glass
21ALU-041	Grant to study the effects of air pollution on soil microorganisms.	Research Grant	103	Glass

PROGRAM ELEMENT NO. 1AA006 – ECOLOGICAL IMPACT OF AIR POLLUTION

Research Objective Achievement Plan 21BBK: **Measurement of Ecosystem Response and Ecological Effects of Salt Water Drift and Useability of Ecological Indices as Indicators of Pollution Stress and Enforcement Tools**

Objective: Research reports, consultation for the Office of Enforcement and General Counsel, enhance agency expertise in assessing environmental impacts of power plants, assessment of general useability of various ecological indices for enforcement and other agency users.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BBK-010	Grant to conduct studies to determine the sensitivity, variability and useability (for enforcement purposes) of indices, and to relate indices to other chemical and physical characteristics of the terrestrial environment.	Research Grant	103	Glass

PROGRAM ELEMENT NO. 1AA008 – FORMATION AND DECAY OF POLLUTANTS

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $205,000
Contracts: See RFP when issued

Program Element Output: Improved understanding of the chemical and physical formation (and/or decay or removal) of important pollutants in the atmosphere. A knowledge of the details of how these pollutants react with each other, with the permanent atmospheric gases, with the sunlight, and the hydrosphere and biosphere will be compiled and used for establishing ambient air quality criteria and establishing a stronger foundation on which to base pollution control strategies and specific pollution control decisions. Among other things, this program will assess, by means of laboratory and field studies, the contribution of pollutants, through their atmospheric reactions, to the atmospheric loading of fine particulates.

Program Element Director (PED):

Dr. Paul Altshuller
Chemistry and Physics Laboratory
National Environmental Research Center
Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 549-8411

PROGRAM ELEMENT NO. 1AA008 - FORMATION AND DECAY OF POLLUTANTS

Research Objective Achievement Plan 21AKB: Determination of the Character and Orgin of Aerosols

Objective: Contribution of the major sources to atmospheric aerosols, quantitative descriptions of the generation and removal rates associated with each major source and sink, characterization of urban, natural, primary source and secondary source aerosols, scientific data for fine particle criteria and standards, quantification of the effects of aerosols on atmospheric chemical reactions.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AKB-056	Fine aerosol research measurements - effects related. Determine elemental analysis, Be to Pb, of fine and course aerosol fractions at a large number of existing monitoring sites.	Research Grant	103	Altshuller
21AKB-057	High resolution mass spectroscopic analyses. Collect aerosol samples. Use high resolution mass spectrometer to determine SO_4, NO_3, NH_4, and detailed hydrocarbon composition. Data used to identify sources and determine growth rates, especially of the organic aerosol component.	Research Grant	103	Altshuller

Research Objective Achievement Plan 21AKC: Formation of Noxious Gases in the Atmosphere

Objective: Reports on the chemical and physical processes involved in the formation, transport, and removal of toxic and noxious substances in the atmosphere; insights into the self-cleansing properties of the atmosphere; rate and mechanism data for mathematical modeling of the polluted reacting air; relationships between pollutant effects and emissions; control strategies for minimizing the formation of noxious gases in the atmosphere.

PROGRAM ELEMENT NO. 1AA008 – FORMATION AND DECAY OF POLLUTANTS

Research Objective Achievement Plan 21AKC

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AKC-042	The measurement of OH in polluted atmospheres. The importance of OH radicals in the consumption of hydrocarbons is discussed by every modeler and kineticist concerned with photochemical smog formation. Unfortunately, no one has yet measured OH in the atmosphere. This contract will be concerned with financing the construction of an instrument which will measure tropospheric OH at ground level.	Contract	103	Altshuller

Research Objective Achievement Plan 21AZM: **The Effects of Aerosol Composition on Visibility**

Objective: Optical properties of primary and secondary aerosols; relationships between visibility loss and aerosol characteristics such as size, shape, and chemical composition; effect of relative humidity on aerosol properties, scientific data for visibility criteria and standards, data from which to derive pollution control strategies which will improve atmospheric visibility.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZM-011	Relation of aerosol chemical properties to light scattering and radiative balance parameters.	Research Grant	103	Altshuller
21AZM-012	Light scattering of non-ideal particles. Determination of scattering diagrams and optical properties of non-ideal particles.	Research Grant	103	Altshuller

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1AA009 – METEOROLOGICAL RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $153,000

Program Element Output: (1) Evaluation of the environmental quality and meteorological-climatological information needed for abatement and control actions; (2) development of analytical models to estimate the relationship between arbitrary distributions of pollution sources and the resultant air quality; and (3) evaluation of the impact of air pollutants on visibility, weather, and climate, at scales ranging from local to global dimensions.

Program Element Director (PED):

Mr. Lawrence Niemeyer
Meteorology Laboratory
National Environmental Research Center
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Research Triangle Park, NC 27711
Telephone: (919) 549–8411

Research Objective Achievement Plan 21AUS: Innovative Development in Air Quality Simulation Modeling

Objective: Among the products and results of this ROAP will be reports on new and improved concepts, models, and methodologies for the development and evaluation of air quality simulation models. Special purpose, user-oriented models will be generated for the solution of special abatement and enforcement problems.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AUS-011	Statistical analysis of the quality of air quality and emission data, and determination of the confidence limits and accuracy of air quality simulation models.	Contract	103	Niemeyer
21AUS-012	Development of parametric program to calculate dispersion parameters from specified mean wind and temperature profiles.	Contract	103	Niemeyer
21AUS-013	Introduce probabilistic forecasting techniques into conventional multiple source urban diffusion models.	Contract	103	Niemeyer

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1BA020 – ARGICULTURAL USES

Funds: No new extramural Tasks which are planned for funding
in the current Fiscal Year

Program Element Output: Information required for the establishment of criteria that will provide a sound scientific basis for setting water quality standards for agricultural uses, including irrigation and the watering of livestock and poultry. Program effort will be directed to (1) determine more flexible criteria required to characterize water quality for irrigation use as modified by climate, soil factors, management practices, quality of water, kinds of crops; and (2) determine tolerance limits for herbicides transported in irrigation water from non-cropped areas to cropland. Included will be an examination of the effects and concentration of trace elements.

Program Element Director (PED):

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Washington, DC 20460
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PROGRAM ELEMENT NO. 1BA021 – FRESHWATER FISHES, OTHER FRESHWATER LIFE, AND WILDLIFE

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: See RFP when issued

Program Element Output: Valid criteria for setting water quality standards for the propagation of freshwater fishes and other aquatic life and wildlife. Program efforts will be directed to develop criteria for fishes, including anadromous fishes, and invertebrates and their food chain organisms, for such factors and pollutants as temperature and dissolved oxygen, heavy metals, pesticides, and constituents of complex organic effluents. Tolerance levels, safe levels, and long-term exposure effects will be determined.

Program Element Director (PED):

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National Environmental Research Center
Environmental Protection Agency
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PROGRAM ELEMENT NO. 1BA021 – FRESHWATER FISHES, OTHER FRESHWATER LIFE, AND WILDLIFE

Research Objective Achievement Plan 16ABI: **Temperature and Dissolved Oxygen Requirements of Freshwater Organisms**

Objective: Data will be developed and disseminated to Regional Offices of EPA for use in setting water quality standards and evaluation of environmental impact statements and to scientific journals for publication. The data developed will include that to be used in application of methods in the section on heat and temperature in the new edition of Water Quality Criteria book.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
16ABI-104	Data recording system at Monticello.	Contract	104b	Mount

PROGRAM ELEMENT NO. 1BA022 – SCIENTIFIC CRITERIA FOR MARINE WATER QUALITY

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $255,000
Contracts: $ 45,000

Program Element Output: Valid criteria for setting water quality standards to protect the integrity of marine and estuarine ecosystems. Specific objectives include 1) determining the effects on marine life of heavy metals, oils, and materials disposed at sea; 2) establishing desirable levels of major environmental variables (pH, D.O., etc.) which can be influenced by man; 3) establishing quality-controlled biological methodology for assessment of pollution effects in both laboratory and field situations and 4) measuring of acute and chronic toxicity to marine organisms and communities with emphasis on long-term sublethal effects which may appear at any life stage or which may alter community function.

Program Element Director (PED):

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PROGRAM ELEMENT NO. 1BA022 - SCIENTIFIC CRITERIA FOR MARINE WATER QUALITY

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-002	Support Conference on Estuarine Pollution.	Research Grant	104b	McErlean

Research Objective Achievement Plan 16AAT: **Criteria for Heavy Metals to Protect Estuarine and Marine Life**

Objective: To determine fate and effects of mixtures of heavy metals discharged into estuarine and coastal areas to recommend maximum allowable concentrations of metals alone or in combination that are not hazardous to marine biota.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
16AAT-023	Determine fate and effects of copper smelter wastes in marine ecosystems.	Research Grant	104b	Schneider

Research Objective Achievement Plan 21AKF: **Ecological Requirements Essential for the Protection of Estuarine and Marine Life**

Objective: Output will be in the form of a series of research reports and technical reports for protecting the quality of the marine environment. The ecological impact in altered levels of environmental variables such as temperature, dissolved oxygen, and salinity will be included. Basic requirements for culturing, holding and protecting marine species will be determined.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AKF-014	Contract for automated on-line continuous flow plankton culture system to produce bioassay and food organisms for filter feeders.	Contract	104b	Schneider

PROGRAM ELEMENT NO. 1BA022 – SCIENTIFIC CRITERIA FOR MARINE WATER QUALITY

Research Objective Achievement Plan 21ARY: Effects of Man-Induced Factors on the Arctic and Subarctic Estuarine Ecosystems

Objective: Publication of research reports and papers that will provide for development of guidelines for management and protection of the Arctic and Subarctic estuarine ecosystem. Development of reports that will provide input into the "National Estuary Study", as required by PL-92-500, Section 104b(n). Publication of guidelines for the disposal of specific wastes into the Arctic and Subarctic estuarine ecosystems and development of an understanding of the effects of these wastes on those ecosystems.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ARY-006	Development of state-of-the-art reports on the effects of pollution stresses on the arctic and subarctic estuarine ecosystems.	Contract	104b	Latimer

Research Objective Achievement Plan 21ARZ: Effects of Oil and Oil Dispersants on the Arctic and Subarctic Estuarine Environment

Objective: Output will consist of a series of reports and publications outlining the effects of petroleum pollutants on the Arctic and Subarctic environments. This output will provide background documentation for development of criteria and standards for water quality management.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ARZ-006	Fate and effects of oil spilled on the arctic and estuarine environment.	Research Grant	104b	Latimer

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1BA023 – FATE OF POLLUTANTS IN FRESH SURFACE WATERS

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: See RFP when issued

Program Element Output: Scientific basis for predicting and assessing the fate of pollutants (municipal, industrial, agricultural, etc.) which enter fresh surface waters and the potential exposure of human and aquatic life to these pollutants. This program will examine the distribution, the pathways, and the rates of movement, accumulation and degradation of pollutants in fresh surface water systems, including the chemical, physical and biological factors which influence these phenomena. As a result of this effort, mathematical models will be developed which interrelate components and processes of aquatic ecosystems, and data will be provided to support the formulation of rational water quality standards.

Program Element Director (PED):

Dr. David W. Duttweiler
Southeast Environmental Research Lab
Environmental Protection Agency
College Station Road
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Research Objective Achievement Plan 03ACQ: Transport and Fate of Selected Inorganic Pollutants in Freshwater Ecosystems

Objective: Research reports which quantitatively describe the transport, transformation, degradation and ultimate fate of select inorganic pollutants having a potentially significant environmental impact. Mathematical models which predict the flow of energy and materials, including selected pollutants through freshwater ecosystems. Scientific information concerning the transport, transformation, degradation, persistence and bioaccumulation of inorganic pollutants for inclusion in EPA criteria documents.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
03ACQ-011	Documentate IBP Aquatic Ecosystem Model for use on EPA computer.	Contract	104b	Duttweiler

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1BA024 – FATE OF POLLUTANTS IN GROUND WATERS

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $233,500

Program Element Output: Determination and quantification of the fate of pollutants entering and traversing a ground water resource domain. Program effort will be to: (1) determine the national scope and nature of ground water pollution problems; (2) establish scientific criteria for waste disposal site selection; (3) determine the effects of surface pollution on ground water quality; (4) develop water quality monitoring and management methods for ground water environments; and (5) develop sub-surface waste disposal deep well injection, waste treatment lagoons, or solid waste landfills.

Program Element Director (PED):

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Robert S. Kerr Environmental Research Lab
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Environmental Protection Agency
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Ada, OK 74820
Telephone: (405) 332–8800

Research Objective Achievement Plan 15AAH: Criteria for Disposal of Pollutants in the Deep Subsurface

Objective: A series of reports covering the environmental aspects of the types of injected wastes, the interaction of these wastes with the subsurface environment, and design, construction, monitoring, and evaluation of pressure increases so that these means of disposal will not contaminate ground water or other natural sources.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
15AAH-003	Develop design, construction, operation, training and maintenance handbook for subsurface disposal industry. This will include materials to be used for various types of waste, acid, etc.	Contract	104b	Galegar

PROGRAM ELEMENT NO. 1BA024 – FATE OF POLLUTANTS IN GROUND WATERS

Research Objective Achievement Plan 21AIO: **Nationwide Assessment of Groundwater Pollution Problems**

Objective: Determine ground-water quality problems in the various regions of the United States. Conduct ground-water quality symposia for technology transfer.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AIO-006	Assessment of ground-water problems in the North Central States.	Contract	104b	Galegar
21AIO-009	Assessment of ground-water problems in the Southeastern States.	Contract	104b	Galegar

PROGRAM ELEMENT NO. 1BA025 – MARINE ECOSYSTEMS IMPACT ON OCEAN DISCHARGE

Funds: Available as of July 1, 1974 for support of listed tasks:

Grants:	$50,000
Contracts:	NONE

Program Element Output: (1) Scientific criteria for the setting of effluent standards for ocean outfalls; (2) Descriptions of ecosystems alterations caused by discharge of pollutant materials to marine environment from point and non-point sources; (3) Predictive techniques and models describing the pathways and ecological effects of pollutants in coastal zones. This program is national in scope and research is oriented to provide results of universal applicability.

Program Element Director (PED):

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Pacific Northwest Environmental Research Lab
National Environmental Research Center
Environmental Protection Agency
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Research Objective Achievement Plan 21AIS: **Criteria for Waste Outfalls in the Marine Environment**

Objective: Reports recommending (1) maximum permissible environmental levels of pollutants and water quality criteria for specific marine uses, (2) maximum effluent concentrations for marine discharges, (3) acceptable discharge locations for allowable materials, (4) laboratory and field measurement techniques necessary for pre- and post-discharge evaluation, and (5) possible controls for atmospheric/riverine input.

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PROGRAM ELEMENT NO. 1BA025 – MARINE ECOSYSTEMS IMPACT ON OCEAN DISCHARGE

Research Objective Achievement Plan 21AIS

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AIS-052	Determine beneficial and detrimental responses of marine organisms to total inputs of pollutional materials (nutrients and toxicants) contained in wastes and carried to the marine ecosystem by riverine inputs and atmospheric washout and fallout. Primary emphasis will be on "red tide" and other phytoplankton responses associated with the New York City plan to comply with the 1977 and 1983 discharge requirements of the Water Pollution Control Act Amendments of 1972.	Research Grant	104b	Jaworski

PROGRAM ELEMENT NO. 1BA026 – FATE OF POLLUTANTS IN LARGE LAKES

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $691,000
Contracts: See RFP when issued

Program Element Output: Scientific basis for predicting and assessing the fate of pollutants in large lakes. Program efforts will be directed towards the development of methodology and information for lake water quality enhancement. Pollution problems of concern include: nutrient enrichment and eutrophication, aquatic weed control, bank erosion and sedimentation, dredge spoils disposal, and industrial waste effects. Development and improvement of mathematical models for lake water quality management is an important sub-objective. (This program is applicable to large lake systems such as the Great Lakes, Great Salt Lake, and the Finger Lakes.)

Program Element Director (PED):

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Research Objective Achievement Plan 05BAA: Analysis of Pollution Problems in the Great Lakes

Objective: (1) A series of State-of-the-Lake reports for each of the five lakes emphasizing current and projected water quality, and pollution sources, sinks, fates, and ecological effects. (2) Reports on specific pollutants and their sources, source distribution, loading rates, ecological effects, and importance throughout the entire Great Lakes drainage basin. Examples are nutrient phosphorus, biocides, toxic substances and viruses.

PROGRAM ELEMENT NO. 1BA026 – FATE OF POLLUTANTS IN LARGE LAKES

Research Objective Achievement Plan 05BAA

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
05BAA-008	Support for lease ships.	Contract	104b	Davies
05BAA-009	Conduct a taxonomy survey of the nearshore algal growths in the Great Lakes to form a baseline before nutrient control programs are institutionalized.	Research Grant	104b	Davies
05BAA-011	Conduct detailed biological assessment of Lake Michigan to determine the effectiveness of the nutrient control program.	Research Grant	104b	Davies

Research Objective Achievement Plan 21AKP: **Dynamics of Chemical, Physical, and Biological Processes Affecting Pollution of Large Lakes**

Objective: A series of math models will be developed with the complexity of large lakes system dictating the time frame of development. Initially models for predicting control measures for nutrients, waste heat and hazard material will be attempted. The long range output will be general ecological models for large lakes system.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AKP-017	Develop model for the movements, storage and transport of hazardous materials in the ecosystem.	Research Grant	104b	Davies
21AKP-018	Develop models for physical factors affecting pollutant transport.	Research Grant	104b	Davies
21AKP-019	Begin model adaptation for other large lakes.	Research Grant	104b	Davies

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1BA031 – EUTROPHICATION AND LAKE RESTORATION

Funds: Available as of July 1, 1974 for support of listed tasks
Grants: $693,000
Contracts: NONE

Program Element Output: Eutrophication control and restoration procedures for the lakes and impoundments in the United States. Specific objectives include: (1) increasing knowledge of the eutrophication process with emphasis on the role of plant nutrients in aquatic systems nutrient cycling among water sediments and biota, and nutrient effects on plant growth; (2) development and demonstration of technology to control and reverse eutrophication processes; and (3) development of methods for monitoring eutrophication conditions and for predicting impact of nutrient sources on the eutrophication of natural waters.

Program Element Director (PED):

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Research Objective Achievement Plan 21AIY: Determination of the Effectiveness of Lake Restoration Procedures

Objective: Lake restoration manuals including engineering and limnological research reports offering guidelines for the selection and application of the various restorative techniques in lakes of differing types.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AIY-023	Prepare a state-of-the-art document on selection, application, and expected results of several lake restoration techniques along with methods to determine cost estimates.	Research Grant	104b	Jaworski

PROGRAM ELEMENT NO. 1BA031 – EUTROPHICATION AND LAKE RESTORATION

Research Objective Achievement Plan 21AJA: **Dynamics of the Eutrophication Process**

Objective: Mathematical models of eutrophic lakes and estuaries which describe biological, chemical, and physical components and their interrelationships and predict their changes.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AJA-025	Determination of criteria to select best lake restorative technique for given situations.	Research Grant	104b	Jaworski

Research Objective Achievement Plan 21AJE: **Assessment of the Impact of Nutrients from Diffuse Sources**

Objective: A series of research reports pertaining to the impact of nutrients from diffuse sources on eutrophication, including the effects of lake restoration programs, control of diffuse sources from a basin-wide systems approach, and comparisons of effects of impacts from different land use types.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AJE-028	Studies to assess the impact of non-point sources of pollutants on basin water quality and to facilitate long-range planning for eutrophication control.	Demo Grant	104b	Jaworski

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1BA032 - THERMAL POLLUTION RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $20,000
Contracts: $60,000

Program Element Output: Improved scientific basis for predicting and assessing the amount, behavior, and non-organic effects of heat discharged to the aquatic environment. The development of environmental systems for safe management of heated discharges, including siting requirements for heat discharging plants and beneficial environmental uses of otherwise wasted heat, will also be undertaken.

Program Element Director (PED):

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Research Objective Achievement Plan 21AJH: Thermal Pollution Research

Objective: Supplemental state-of-the-art reports to the 270-day report to Congress (Section 104b(t)). Reports, mathematical models, computer programs and/or monograph solutions for predicting (a) physical dispersion and dissipation of heat and ancillary cooling wastes discharges to water and atmosphere, (b) environmental impacts of cooling water intake structures, (c) water requirements of exploiting the energy resources of the Northern Great Plains.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AJH-040	Refinement of cooling tower plume models.	Contract	104b	Jaworski
21AJH-046	Statistical analysis of drift data obtained during Turkey Point Demonstration.	Contract	104b	Jaworski
21AJH-048	Determine long range implications of thermal discharges on water quality.	Research Grant	104b	Jaworski

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1DB063 – COLLECTION AND PROCESSING

Funds: No new extramural Tasks which are planned for funding
in the current Fiscal Year

Program Element Output: (1) Storage, collection, and transportation, health and environmental effects, and technology assessment for both residential and commercial solid waste management; (2) new or improved processes for safe and efficient reduction of the amounts of solid wastes which must be disposed, including combustion, densification and separation of systems. These processes and technologies will be used for the purpose of establishing standards and for planning and implementing programs relating to ultimate disposal and recycling schemes. Baseline operating conditions for incinerators, the characterization of incinerator emissions, and design and use data for incineration of solid wastes and hazardous materials will be provided.

Program Element Director (PED):

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PROGRAM ELEMENT NO. 1DB064 – DISPOSAL TECHNOLOGY

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $265,000
Contracts: $840,000

Program Element Output: Guidelines and/or policy decisions for sanitary landfill design, construction, and operation for hazardous industrial and municipal wastes. Recommendations will be developed relative to dry versus wet land disposal and cover versus no cover landfill practices. Program efforts will produce methods for identification and control of gases and methods for the control and treatment of leachate. Reports will be compiled on pathogen survival, movement and control; and design criteria will be established for settlement. Disposal options such as deep well injection, salt mine and others will be evaluated in terms of hazardous waste material disposal. This program will be conducted at both laboratory and field sites. An evaluation of transport phenomena of hazardous materials through the soil media, soil moisture holding capacity, and environmental effects of sludge disposal in sanitary landfills will be provided.

Program Element Director (PED):

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PROGRAM ELEMENT NO. 1DB064 – DISPOSAL TECHNOLOGY

Research Objective Achievement Plan 21BFO: Migration of Hazardous Materials from Land Disposal Sites

Objective: A series of research reports describing the potential for migration, through soil, of hazardous materials from selected industrial wastes and pesticides directed to the land for disposal. Emphasis will be placed on quantitative description of the migration behavior of the hazardous material and on the way in which such information may be used in developing criteria for environmentally safe design and operation of land disposal sites. Additionally, reports will be prepared on migration of landfill leachate and on procedures for deepwell disposal of hazardous wastes.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BFO-003	Survey literature for soil-waste interaction data relating to specific wastes and soils.	Contract	204	Stenburg
21BFO-004	Survey literature to document pesticide mobility in soils and determine needs for further research.	Research Grant	204	Stenburg
21BFO-008	Field studies of migration and attenuation mechanisms at selected disposal sites in arid regions.	Research Grant	204	Stenburg
21BFO-009	Determine potential for migration through soil of hazardous materials from selected industrial waste streams.	Contract	204	Stenburg

Research Objective Achievement Plan 21BFP: Environmental Effects of Sanitary Landfills

Objective: A series of research reports that document (1) current knowledge on effects of sanitary landfills and/or land disposal of municipal and hazardous wastes on water quality, gas production and associated hazards, i.e., vegetation kill, settlement, site utilization; (2) effects of leachates on fixed (chemically or encapsulated) wastes, impoundment membranes; (3) factors to be controlled to minimize environmental degradation. A seminar early in FY 75 will present updated findings and state-of-the-art of sanitary landfills. The report series and seminar feedback will be followed by a comprehensive report on environmental effects of sanitary landfills and/or land disposal in the preparation of a comprehensive design manual. The resulting criteria would be utilized to develop standards.

PROGRAM ELEMENT NO. 1DB064 – DISPOSAL TECHNOLOGY
Research Objective Achievement Plan 21BFP

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BFP-004	Determine the rate and extent of vegetation kills in the sanitary landfill environs and recovery therefrom.	Contract	204	Stenburg
21BFP-008	Determine the physical and environmental effects of mixing liquid/solid hazardous/toxic industrial chemicals, stillbottoms and/or sludges with municipal solid waste in a sanitary landfill.	Contract	204	Stenburg
21BFP-014	Develop and conduct technical seminars on state-of-the-art for sanitary landfills including liquid and sludge disposal into a landfill environment.	Research Grant	204	Stenburg

Research Objective Achievement Plan 21BFQ: **Production of Landfill Leachate and Gas from Municipal Waste Landfills**

Objective: Reports documenting the quantity and quality of leachate and gas generated during decomposition of municipal solid waste in santiary landfills, methods for controlling these waste streams, and recommended analytical, sampling and surveillance techniques for monitoring leachate and gas movement.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BFQ-003	Evaluation and recommendation of analytical methods and sample gathering and preservation techniques.	Contract	204	Stenburg
21BFQ-005	Determining hydraulic properties of solid wastes.	Contract	204	Stenburg
21BFQ-015	Evaluate on a field scale, landfill stabilization by leachate recycle and residual treatment.	Research Grant	204	Stenburg

PROGRAM ELEMENT NO. 1DB064 – DISPOSAL TECHNOLOGY

Research Objective Achievement Plan 21BFQ

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BFQ-019	Determine influence of moisture and temperature regimen on quality and quantity of gas produced from municipal refuse.	Research Grant	204	Stenburg

PROGRAM ELEMENT NO. 1DB311 – HAZARDOUS SOLID WASTES

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $674,000

Program Element Output: Safe and effective techniques for the characterization, collection, treatment and disposal of hazardous waste materials. These wastes may include, among others: industrial and chemical wastes, hospital wastes, pathogenic wastes, pesticides and pesticide containers. Data necessary for standard and guideline formulation will be developed and evaluated. Health effects and transport processes related to the above will be investigated and assessed.

Program Element Director (PED):

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National Environmental Research Center
Environmental Protection Agency
Cincinnati, OH 45268
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Research Objective Achievement Plan 21BFR: Chemical Processes and Technologies for Hazardous Waste Treatment and Control

Objective: Continue updating of new acceptable methodologies for recovery/disposal of hazardous waste streams. Identification, evaluation and development of promising technologies for conversion of hazardous materials to reusable hydrocarbon compounds, concentration of heavy metal waste streams through counter current continuous ion exchange processes, detoxification of hazardous wastes through low temperature microwave plasma technology, studies of chemical degradation and evaluation of methods for impoundment of hazardous waste.

PROGRAM ELEMENT NO. 1DB311 – HAZARDOUS SOLID WASTES

Research Objective Achievement Plan 21BFR

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BFR-004	Detoxification of hazardous materials by low temperature micro-wave plasma.	Contract	204	Stenburg

Research Objective Achievement Plan 21BKU: Preparation and Defense of Hazardous Waste Disposal Scientific Summary Documents

Objective: Publishable scientific summary documents on the human health and environmental effects of selected hazardous pollutants and their related compounds. These documents are to be of a caliber suitable for inclusion in criteria documents to be prepared by OSWMP in support of their activities to develop and implement a program for the regulation of hazardous waste management practices, including the development of standards.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BKU-002	Criteria document for Mercury.	Contract	204	Stenburg
21BKU-003	Criteria document for Asbestos.	Contract	204	Stenburg
21BKU-004	Criteria document for Cadmium.	Contract	204	Stenburg
21BKU-005	Criteria document for Chromium.	Contract	204	Stenburg
21BKU-006	Criteria document for Lead.	Contract	204	Stenburg
21BKU-011	Criteria Document for PCB's.	Contract	204	Stenburg

Research Objective Achievement Plan 21BKV: Pesticides Treatment and Disposal

Objective: Continue updating of new, acceptable methodologies for recovery/disposal of hazardous waste streams. Identification, evaluation and development of promising technologies for conversion of pesticide compounds to reusable hydrocarbon compounds. Studies of chemical degradation, pesticide incineration time-temperature relationships.

PROGRAM ELEMENT NO. 1DB311 – HAZARDOUS SOLID WASTES

Research Objective Achievement Plan 21BKV

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BKV-004	Develop and evaluate for use in the field workable chemical methods to degrade/detoxify pesticidal materials.	Contract	204	Stenburg
21BKV-006	Supplemental pesticide incineration studies to determine residence time, temperature and other conditions necessary for safe disposal of specific formulations.	Contract	204	Stenburg
21BKV-007	Summarization of available time temperature relationships for dextoxification (incineration) of pesticides; also an overview of the various Government and and non-government funded studies related to pesticide disposal by incineration, with the purpose of identifying data gaps for future research.	Contract	204	Stenburg

PROGRAM ELEMENT NO. 1DB314 – RESOURCE RECOVERY TECHNOLOGY

Funds: No new extramural Tasks which are planned for funding in the current Fiscal Year

Program Element Output: (1) Methods and implementation-activities which will stabilize the quantities of solid waste being generated; (2) systems which will allow greater percentages of solid waste material collected to be recycled by energy recovery, materials reuse, and materials conversion. Emphasis will be placed on shifting the relative economics of resource recovery by internalizing the external costs involved in virgin materials extraction and processing and in disposal. Safe recovery of hazardous wastes as an option to disposal will be investigated. Use of solid waste as a fuel in energy recovery incinerators is investigated.

Program Element Director (PED):

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ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1EA077 – MARINE ECOSYSTEM IMPACT OF SYNTHETIC ORGANIC COMPOUNDS

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $105,000
Contracts: $100,000

Program Element Output: (1) Information essential for the pesticide registration and control programs; and (2) supporting data for the development of water quality criteria for aquatic life. This information includes the interaction of pesticides with other pollutants including heavy metals; the ecological tolerance levels and effects of sublethal concentrations of pesticides on aquatic ecosystems; and the *in situ* generation of toxic substances by the interaction of chlorine with organic compounds in marine ecosystems. Investigations will be conducted on estuarine and marine flora and fauna.

Program Element Director (PED):

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Environmental Protection Agency
Sabine Island
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ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-002	Support workshop on bioassays.	Research Grant	20	McErlean

Research Objective Achievement Plan 10AKC: **Impact of Selected Synthetic Organic Compounds on Marine Ecosystems**

Objective: Direct output into establishment of water quality criteria and label registration of pesticides. Provide basic understanding of movement of pesticides in the marine environment, and provide methods for evaluation of effects. These data will continue to flow from the research throughout the period of study. Generate systems analysis models of effects of toxic organics in estuaries for use by the proper agencies which deal with water quality standards and label registration.

PROGRAM ELEMENT NO. 1EA077 – MARINE ECOSYSTEM IMPACT OF SYNTHETIC ORGANIC COMPOUNDS

Research Objective Achievement Plan 10AKC

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
10AKC-042	Determine the effects of selected toxic organic compounds on the activity of blue crabs.	Research Grant	20	Duke
10AKC-046	Processing of animal tissue for historical and pathological studies.	Contract	20	Duke
10AKC-047	Biochemical characterization, insect cell line culture, and determination of host specificity of pink shrimp nuclear polyhedrosis virus.	Research Grant	20	Duke
10AKC-050	Preventative maintenance contract for Gulf Breeze and Bears Bluff laboratories.	Contract	20	Duke

Research Objective Achievement Plan 16AAS: Effects of Free Chlorine and Chloro Derivatives to Selected Marine Organisms

Objective: To produce reliable data to be used by federal, state, and local water quality personnel in establishing baseline criteria for the estuarine environment and the effluents discharged into them.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
16AAS-001	To determine the fate of free chlorine and chloro derivatives vs. ozonation in the marine environment and their effects on selected marine organisms.	Research Grant	20	Duke
16AAS-005	Determine environmental impact of a chlorination process effluent by comparing community contents relative to species.	Research Grant	20	Duke

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1EA080 – ALTERNATIVE METHODS OF PEST CONTROL

Funds: Available as of July 1, 1974 for support of listed tasks:

Grants:	**$185,000**
Contracts:	**NONE**

Program Element Output: Methods of pest control which will cause significantly less environmental disruption than that caused by currently available pesticides. Research topics include, among others, biological control of pests, genetic manipulations of pest and target organisms, use of pheromones in insect population management, cropping practices in regard to pest ecology, economic aspects of crop losses and means of integrating various methods for effective control. This program is closely coordinated with the National Science Foundation and the U.S. Department of Agriculture.

Program Element Director (PED):

Mr. Robert A. Papetti
Ecological Processes and Effects Division (RD-684)
Office of Research and Development
Environmental Protection Agency
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Research Objective Achievement Plan 06ALI: Strategies, Tactics, and Effects of Pest Population Regulation and Control in Major Crop Ecosystems

Objective: Reports treating insect population interactions; physiological and/or economic injury thresholds; social economic and systems analysis of pest management; use of natural enemies, pathogens and plant resistance; cultural and physical control methods; biochemical aspects of insect control including use of pharomones, hormones, etc., selective use of pesticides in conjunction with other measures; and selective use of genetic tools and controls.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
06ALI-004	Effects of alternative pest management methods under urban, suburban, and/or rural practices.	Research Grant	20	Papetti
06ALI-008	Study on implementing line pest-management system utilizing biological and meteorological information for developing control tactics and/or strategies.	Research Grant	20	Papetti

PROGRAM ELEMENT NO. 1EA080 – ALTERNATIVE METHODS OF PEST CONTROL

Research Objective Achievement Plan 06ALI

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
06ALI-009	Study for control of mosquito by non-chemical biological or similar non-pesticide approaches.	Research Grant	20	Papetti
09ALI-010	Study for control of cockroaches by use of non-pesticide means, including habital alteration.	Research Grant	20	Papetti

PROGRAM ELEMENT NO. 1EA435 – ECOLOGICAL EFFECTS RESEARCH OF PESTICIDES ON THE TERRESTRIAL ENVIRONMENT

Funds: No new extramural Tasks which are planned for funding in the current Fiscal Year.

Program Element Output: (1) Development and evaluation of data on the synergistic effects on plants and animals of exposure to pesticides. (2) Determination of the acute and chronic effects on ecosystems from both continuous and brief exposure to pesticides. (3) Determination of the pathways and mechanisms of microbial degradation of pesticides in the terrestrial environment. (4) Assays of pesticides involved in EPA's registration process for effects on specific terrestrial organisms in populations of "indicator" species. The criteria for studying the effects of pesticides include, but are not limited to, acute toxicity, population dynamics; parameters such as survivorship, mortality, fertility, fecundity, age distribution, sex ratios, community productivity, species diversity, energy flow, production and degradation of metabolic products, biotic and abiotic sinks for pesticides.

Program Element Director (PED):

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ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1EA487 – PESTICIDE CANDIDATE CHEMICALS ECOLOGICAL PROCESSES AND EFFECTS

Funds: No new extramural Tasks which are planned for funding in the current Fiscal Year.

Program Element Output: The determination of the ecological impact on terrestrial ecosystems of candidate pesticide chemicals which may be suitable as replacements for known pesticides with undesirable characteristics. Specific objectives include: (1) development and evaluation of data on the effects on plants and animals from exposure to the new candidate chemicals; (2) determination of the acute and chronic effects on ecosystems from both continuous and brief exposure to candidate pesticide chemicals; (3) determination of the pathways and mechanisms of degradation of these compounds in the terrestrial environment, and (4) upon request, assay the candidate pesticides involved in EPA's registration process for effects on specific terrestrial organisms and populations of "indicator" species. The criteria for studying the effects of candidate pesticide compounds include, but are not limited to, acute toxicity, population dynamics, parameters such as survivorship, mortality, fertility and fecundity, age distribution, sex ratios, community productivity, species diversity, energy flow, production and degradation of metabolic products and biotic and abiotic sinks for the candidate chemicals.

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ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1FA083 – RADIATION PATHWAYS RESEARCH

Funds: No new extramural Tasks which are planned for funding in the current Fiscal Year.

Program Element Output: Information on the behavior, movement, and fate of radionuclides in the aquatic, terrestrial and air environments which will be useful for the purpose of assessing the radiation dose to man resulting through these multiple pathways. Laboratory surveys of the pathways by which radionuclides move through the environment of man will provide a basis for setting radiation protection guides and standards, particularly for nuclear power facilities.

Program Element Director (PED):

George B. Morgan
Monitoring Systems Research & Development Lab
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Las Vegas, NV 89114
Telephone: (702) 736-2969

PROGRAM ELEMENT NO. 1LA428 – TOXIC SUBSTANCES – ECOLOGICAL EFFECTS RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $100,000
Contracts: See RFP when issued

Program Element Output: Selection, development, evaluation and use of model ecosystems, or microcosms, for screening toxic substances. These microcosms will provide information on (1) the physical, chemical, and biological transformations, pathways and fate of toxic materials introduced into the environment, and (2) the effects of toxic materials on important ecological processes, ecosystem components and ecosystem-level parameters.

Program Element Director (PED):

Dr. David W. Duttweiler
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Environmental Protection Agency
College Station Road
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PROGRAM ELEMENT NO. 1LA428 – TOXIC SUBSTANCES – ECOLOGICAL EFFECTS RESEARCH

Research Objective Achievement Plan 21BLC: **Evaluation of Toxic Substances Fate and Effects Using Laboratory Model of Ecosystem, or Microcosms**

Objective: Research reports on the selection, development and evaluation of optimum model ecosystems or microcosms for use in screening toxic substances to indicate their transport, distribution, transformation and accumulation when discharged into various environmental compartments within U.S. territorial biomes. Outputs from such model systems screening should provide the basis for preliminary administrative decisions as to the environmental compatibility or impact of toxic substances and/or the need for additional detailed research studies.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BLC-003	Develop and evaluate new microcosm methods to study biotic and abiotic transport, accumulation and degradation of toxic substances in selected ecosystem types.	Research Grant	104	Duttweiler
21BLC-004	Conduct field evaluation of individual and combined microcosm methods to determine correlation between microcosm results and field behavior.	Contract	104	Duttweiler

ECOLOGICAL PROCESSES AND EFFECTS PROGRAM AREA

PROGRAM ELEMENT NO. 1LA436 – TOXIC SUBSTANCE EFFECTS IN THE TERRESTRIAL ENVIRONMENT

Funds: No new extramural Tasks which are planned for funding
in the current Fiscal Year.

Program Element Output: The determination of the ecological impact of toxic substances on terrestrial ecosystem. Specific objectives include: (1) Development and evaluation of data on the effects on plants and animals from exposure to toxic substances; (2) Determination of the acute and chronic effects on ecosystems from both continouous and brief exposure to toxic substances; (3) Determination of the pathway and mechanisms of degradation of toxic substances in the terrestrial environment, and (4) Assays of new toxic substances involved in EPA's pre-marketing screening process for effects on specific terrestrial organisms and populations of "indicator" species. The criteria for studying the effects of toxic substances include but are not limited to, acute toxicity population dynamics, parameters such as survivorship mortality, fertility, fecundity, age distribution, sex ratios, community productivity, species diversity, energy flow, production and degradation of metabolic products and biotic and abiotic sinks for toxic substances.

Program Element Director (PED):

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PROGRAM ELEMENT NO. XF1107 – AEC ANIMAL INVESTIGATION PROGRAMS

Funds: No new extramural Tasks which are planned for funding
in the current Fiscal Year.

Program Element Output: An evaluation of the uptake and distribution of radionuclides in tissue and bone samples from domestic and game animals in the environs of nuclear testing. Knowledge of the tissue distribution of radionuclides in the animals, in areas adjacent to nuclear testing sites will provide input into a review of design and testing criteria.

Program Element Director (PED):

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MUNICIPAL POLLUTION CONTROL PROGRAM AREA

The Municipal Pollution Control Program Area covers the research, development and demonstration of new or improved technology applicable to the control and treatment of wastewaters generated in and discharged from the urban environment. Pertinent technical areas include unit processes and systems applicable to treatment of municipal sewage to effect the removal of organic materials and other pollutants; control and treatment of wastewaters discharged from sewer systems carrying both storm water and sewage (combined sewers) and urban storm water discharges. The entire urban drainage system is, therefore, included in the Municipal Water Control Technology Program.

Beyond the basic development and demonstration of processes and systems, efforts are also directed to process control and instrumentation, computerized systems for process simulation and evaluation and non-pollutional disposal and/or utilization of sludges and concentrated pollutants resulting from treatment.

Several specialized areas of emphasis are included in the Municipal Water Control Technology Area. The treatment of municipal wastewaters in cold climates (sub-arctic and arctic areas) is one of these. A unique portion of this cold climate research and development is directed to the provision of effective water supply, wastewater treatment and general sanitation facilities for native Alaskan villages.

The treatment and utilization of both liquid and solid fractions of wastewater by application to the soil is a separately identified technical area, as is the improvement of existing and development of new treatment and disposal methods applicable for individual home use.

Program Area Manager (PAM):

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MUNICIPAL POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1BB033 - MUNICIPAL SEWERED DISCHARGES

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $100,000
Contracts: $249,000

Program Element Output: New or improved technology for the effective and economical control of pollution from municipal sewered discharges. Program efforts will be concentrated on full-scale demonstrations and evaluation of new treatment trains and systems. Technology for achieving high performance levels in removing organic materials, nutrients, and other pollutants so that municipal sectors will be able to achieve compliance with present and future water quality standards will be emphasized. Improved methods of operating both new and existing treatment works will be developed and demonstrated. Determination of cost effectiveness of treatment systems is an important function.

Program Element Director (PED):

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Research Objective Achievement Plan 21ASV: Evaluate Combination of Processes to Meet Water Quality Needs

Objective: ROAP output will include a series of reports describing applicable design criteria, capital and operating costs, reliability, and long term performance data from a number of full-scale conventional and advanced waste treatment plants designed to achieve specific water qualities including: 1) secondary treatment, 2) best practicable treatment, 3) tertiary treatment including high level organic, nitrogen, and phosphorus removal and 4) quality approaching non-polluting discharges. Major emphasis will be placed on identification of effluent quality required by water quality limited stream segments, and on the optimization of systems to achieve the required quality under varying topographic, climatic, and legislative constraints.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASV-042	Engineering evaluation and analysis of systems.	Contract	104b	Convery

PROGRAM ELEMENT NO. 1BB033 - MUNICIPAL SEWERED DISCHARGES

Research Objective Achievement Plan 21ASW: Methods and Processes to Provide Improved Operation and Maintenance, Flow Reduction, Equalization, and In-System Treatment

Objective: ROAP output includes evaluation of dry-weather flow equalization to improve the performance of new and existing wastewater treatment plants. The most feasible methods of in-sewer treatment, sulfide control in force mains and gravity collection systems will be evaluated. Major sources of in-plant odor will be identified and most feasible control technology will be evaluated. A long term cooperative effort will be undertaken with the Municipal Operations Branch of the Office of Water and Hazardous Materials and with the Office of Enforcement and General Counsel to identify major O&M problems, relate plant performance to level of O&M, evaluate new O&M procedures, document improved plant performance and prepare source summary reports to be used for new O&M guidelines.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASW-015	Evaluate plant-scale flow equalization using in-plant aerators.	Demo Grant	104b	Convery
21ASW-018	Establish performance and reliability of selected biological treatment plants as a function of operation and maintenance.	Contract	104b	Convery

PROGRAM ELEMENT NO. 1BB034 - COMBINED SEWER OVERFLOWS AND STORM WATER DISCHARGES

Funds: Available as of July 1, 1974 for support of listed tasks:

Grants:	$421,000
Contracts:	$204,000

Program Element Output: New or improved methods of abating pollution caused by (1) discharge of untreated or inadequately treated waters from sewers which carry either storm water or both storm water and sewage, and (2) urban run-off not collected and carried in sewers to a point discharge. Program efforts will be to characterize the quality and pollution impact of these wastewaters and to develop methods (processes, hardware and techniques) for their control and treatment. Emphasis will be placed on advanced technology for full-scale plant systems and cost effectiveness of developed systems.

Program Element Director (PED):

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PROGRAM ELEMENT NO. 1BB034 – COMBINED SEWER OVERFLOWS AND STORM WATER DISCHARGES

Research Objective Achievement Plan 21ASY: **Combined Sewer Overflow Hydraulic and Pollutant Control**

Objective: A series of reports including compilations, descriptions, assessments and demonstrations of the best practicable technology and associated costs for (1) identifying the impact of combined sewer overflows; (2) source/surface control; (3) sewerage system control including instrumentation/automation, flow improvement and regulation, infiltration/ inflow reduction, and storage; (4) treatment and disinfection; and (5) integrated systems including dual (wet & dry-weather) use of facilities and reclamation. Final information in the form of working design manuals and guidelines for communities and engineers; and informative source for decision-making in planning agencies, enforcement, action, land use determinations and basin management. This ROAP responds to Section 105(a)(1) of the 1972 Federal Water Pollution Control Act (FWPCA) Amendments.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASY-005	Develop mean pollutographs and loading factors (normalized) for common geographic, demographic, and climatologic conditions; for general land/uses/drainage systems such as commercial, residential and industrial/combined, separate and unsewered; for specific land uses such as, sanitary landfills, construction sites, urban/suburban home environment, specific industries; and for other unit waste contributions to S&CSO pollution such as air pollution fallout, tidal backwater intrustion, automobile emission etc.	Demo Grant	105	Convery

PROGRAM ELEMENT NO. 1BB034 – COMBINED SEWER OVERFLOWS AND STORM WATER DISCHARGES

Research Objective Achievement Plan 21ASY

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASY-022	Update the state-of-the-art on S&SCO technology and develop capability profiles with related costs based on key variables on individual unit processes and on alternate combinations of pollution abatement trains for S&SCO as a function of desired sustained use or water quality limits of the receiving water. Develop typical examples of drainage system analyses including ranking of various (wet/dry-weather) effluents and receiving water impact evaluation as related to common urban environmental condition (as a function of demography, geography, system configuration, etc.)	Contract	105	Convery
21ASY-025	Evaluate full-scale swirl degritter (constructed by others) and summarize the design criteria/performance/potential of both the swirl device for flow regulation, primary treatment and grit removal and the helical device for flow regulation. The final documents shall be in the form of a design manual/proceedings together with a descriptive film which together will be utilized for a "swirl/helical seminar."	Contract	105	Convery
21ASY-070	Evaluate the extent and problems associated with extraneous water entry into sewer systems, and develop/evaluate remedial measures for the major causes. Also develop/demonstrate rapid and simple techniques for the detection of sewer infiltration/inflow.	Research Grant	104b	Convery

PROGRAM ELEMENT NO. 1BB034 - COMBINED SEWER OVERFLOWS AND STORM WATER DISCHARGES

Research Objective Achievement Plan 21ATA: Simulation Models for Total Management of Sewerage Systems

Objective: A series of reports/documentation and computer models which will describe and simulate the total wet and dry-weather flow management of sewerage systems. User's manuals and simplified models as planning aids. A models management program for updating, user assistance, and dissemination. The user oriented models will be directed toward audiences interested in planning, design, control, and operation. Models will be eventually utilized as a basic tool for "urban intelligence systems" offering real-time wet and dry weather control of sewerage networks. Model extensions to assist in basin planning for compliance with intent of Section 105(b) of the 1972 Federal Water Pollution Control Act (FWPCA) Amendments.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ATA-029	Develop and demonstrate new and improved model for design of combined sewer to prevent solids sedimentation and to optimize construction costs. Evaluate solids transport, flow patterns self-cleaning velocity in sewer system.	Research Grant	104b	Convery
21ATA-030	Augment and develop software for computerized control of combined sewer overflow systems, including storage elements, regulators and tide gates. Integrate control methods into system operation and compare to semi-automatic operation.	Research Grant	104b	Convery
21ATA-031	Storm Water Management Model (SWMM) management seminar, including urban hydrologic models and applications of urban models in planning, evaluation and design, etc.	Demo Grant	105	Convery
21ATA-032	Refine/verify simplified version of SWMM to handle large areas with minimal data input, including sensitivity analysis, as a planning aid.	Contract	105	Convery

MUNICIPAL POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1BB035 – NON-SEWERED DOMESTIC WASTES

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $101,000

Program Element Output: Demonstration of technology for the effective and economical control of pollution from non-sewered wastes so that municipal and rural sectors lacking conventional gravity collection systems will be able to upgrade their treatment capabilities to achieve compliance with present and future water quality standards. Program efforts will be to: (1) demonstrate flow reduction devices for the individual home; (2) develop and demonstrate improved home treatment systems; (3) examine economically feasible alternatives to existing septic tank systems; and (4) demonstrate intermediate systems between conventional sewers and individual systems.

Program Element Director (PED):

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Research Objective Achievement Plan 21ATC: **Research and Development to Eliminate Pollution from Small Waste Flows**

Objective: New technology for the collection, treatment and disposal of wastewaters from individual homes, small communities and recreational areas will be developed, demonstrated and evaluated to determine the applicability, design guidelines, cost, reliability and operation and maintenance needs. The results of these studies will be made available as reports for use by regulatory agency for code and criteria development by engineers for selection and designing purposes and by all other organizations or individuals affected by small-flow wastewater problems.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ATC-025	Characterization of wastewaters from a variety of non-sewered sources for use in system design by consulting engineers.	Contract	104b	Convery

MUNICIPAL POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1BB043 – TREATMENT PROCESS DEVELOPMENT AND OPTIMIZATION

Funds: Available as of July 1, 1974 for support of listed Tasks:

Grants:	$914,000
Contracts:	$275,000

Program Element Output: Process information for use in engineering design of municipal and municipal/industrial wastewater treatment plants. Program efforts will be directed to development of: 1) technology for upgrading performance of existing biological treatment plants; 2) environmentally safe means for sludge processing, utilizaton, and disposal; 3) cost-effective processes for removal of pollutants; 4) reliable systems for the renovation and reuse of wastewater; and 5) process control, instrumentation and automation technology. This effort will include major pilot plant work devoted to developing advanced treatment processes and trains. Full-scale demonstration of new unit processes and determination of cost effectiveness are integral parts of this program.

Program Element Director (PED):

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Research Objective Achievement Plan 21ASC: **Wastewater System Instrumentation and Automation**

Objective: An adequate technical base is needed to show the designer how all municipal wastewater treatment processes and entire plants can be controlled to maximize performance and/or reduce the cost of treatment. The technical base will take the form of design and cost information, process performance measurements with and without control, cost-effectiveness analyses, and full-scale evaluation of control loops in wastewater treatment plants.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASC-013	By means of measurement and analysis, develop practicable automated control schemes for anaerobic digesters for plants in the 1–100 mgd size range. Concepts such as scheduling of load, recycle of viable sludge, base addition scrubbing of off gas, etc. will be considered.	Demo Grant	105	Convery

PROGRAM ELEMENT NO. 1BB043 – TREATMENT PROCESS DEVELOPMENT AND OPTIMIZATION

Research Objective Achievement Plan 21ASC

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASC-015	Identify the principal control problems associated with sludge thickening and dewatering and develop control schemes to improve operation and/or reduce cost. Processes involved are gravity and air flotation thickening, vacuum filters, centrifuges and filter presses.	Demo Grant	105	Convery
21ASC-039	Evaluate the effectiveness of best practical technology available for automation of a full-scale biological treatment plant. Include cost analysis, training and manpower requirements, and outline preventive maintenance devices for instruments and automatic devices.	Demo Grant	105	Convery

Research Objective Achievement Plan 21ASE: Wastewater Treatment Sludge Disposal

Objective: Reports of full-scale demonstrations of reliable economical methods for disposal of sludges. Reports on pilot-scale and laboratory investigations of promising processes with recommendations regarding further work. Contributions to Technology Transfer Process Design Manuals and Construction Grant Guidelines. Technical papers and lectures on sludges disposal. Demonstrations of various methods of sludge disposal especially land spreading and soil injection of wet sludge with appropriate dissemination of information to the public.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASE-001	Evaluate performance of a facility which will pyrolyze or incinerate a mixture of sewage sludge and solid waste producing sufficient heating value to meet wastewater treatment plant heat requirements.	Demo Grant	105	Convery
21ASE-015	Evaluation of complete wet oxidation, to determine the effectiveness of wet oxidation in the presence of a catalyst.	Contract	104b	Convery

PROGRAM ELEMENT NO. 1BB043 – TREATMENT PROCESS DEVELOPMENT AND OPTIMIZATION

Research Objective Achievement Plan 21ASE

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASE-020	A demonstration of landspreading of sludge in an arid or semi-arid climate of the Southwest. The technology for reutilization of sludge by using it as a soil conditioner and fertilizer is site dependent. Spreading sludge on soils in a warm dry climate is to be demonstrated.	Demo Grant	105	Convery
21ASE-046	With this contract for fixed costs of sludge pilot plant, develop a method for producing a salable fertilizer and soil conditioner using nitrogen in supernatnat to fortify the nurtient content of the dried sludge. Evaluate existing drying process and wet oxidation process.	Contract	104b	Convery

Research Objective Achievement Plan 21ASR: **Biological Treatment Process Improvement for Municipal Wastewater Applications Upgrading**

Objective: Through assessment of all potentially attractive techniques for upgrading conventional biological treatment processes and evaluation of the more attractive newer biological processes, both coupled with demonstrations of the more promising methods to provide water pollution control agencies and consulting engineers with the necessary performance characteristics, design guidelines, reliability factors, and cost data to meet promulgated EPA Secondary Treatment Guidelines, anticipated EPA Best Practicable Treatment Guidelines, and all other governing Water Quality Standards.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASR-052	Demonstrate the mixed liquor strainer and to upgrade suspended solids removal at a full-scale aerated lagoon.	Demo Grant	105	Convery
21ASR-060	Demonstrate at full scale the uncovered reactor oxygen-activated sludge system evaluated at pilot scale.	Demo Grant	105	Convery

PROGRAM ELEMENT NO. 1BB043 – TREATMENT PROCESS DEVELOPMENT AND OPTIMIZATION

Research Objective Achievement Plan 21ASR

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASR-104	Demonstration of full-scale integrated rotating biological contactor (RBC) plant designed to remove organics, suspended solids, phosphorus, and nitrogen via denitrification without methanol addition (likely candidate site – Seldon, Long Island, New York.)	Demo Grant	105	Convery
21ASR-105	Evaluate potential of rotating biological contactors (RBCs) to upgrade typical primary clarifier performance to secondary treatment quality by installing RBCs in upper half of primary tank an using lower half for secondary clarification (likely candidate site – Passaic, New Jersey).	Demo Grant	105	Convery

Research Objective Achievement Plan 21ASS: Municipal Wastewater Disinfection

Objective: Reports will be provided to establish costs of disinfecting effluent and recycled waters to meet specified regulatory microbiological requirements with chlorine, ozone, bromine, bromine chloride, ultraviolet light, excess lime, iodine and other disinfectants. Chlorine contactor guidelines and a state-of-the-art of disinfection will be provided. Wastewater quality will be related to disinfecting efficiency to provide guidelines for maximum tolerable limits of interfering wastewater components. Toxicity limits will be specified for receiving water biota and operating costs will be provided for dechlorination.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASS-014	Determine the ability of untraviolet light to disinfect secondary activated sludge plant effluents after they have been subjected to tertiary settling both with and without addition of settling agents and/or filtration. Primary criterion will be coliform reduction. Anticipated volume 30 KGD but may be scaled down.	Contract	104b	Convery

PROGRAM ELEMENT NO. 1BB043 – TREATMENT PROCESS DEVELOPMENT AND OPTIMIZATION

Research Objective Achievement Plan 21ASS

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASS-023	Present a seminar/workshop for regional and program office personnel on status and output of current research on disfection processes. To be held at Wyoming, Michigan.	Demo Grant	105	Convery

Research Objective Achievement Plan 21ASU: Control of Dissolved Organics by Physical-Chemical Processes

Objective: Full-scale demonstrations of several cost-effective treatment trains utilizing activated carbon for control of dissolved organics in either IPC or tertiary mode. Engineering manuals giving design, performance and cost and reliability of physical-chemical methods of controlling dissolved organics for a wide range of plant size and treatment requirements. Feasibility and pilot studies of chemical oxidation and other methods of organics removal.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASU-015	Engineering and economic evaluation of PAC treatment. Identify areas of applicability for PAC together with cost sensitive parameters.	Contract	104b	Convery
21ASU-037	Characterize performance of rotary kiln for GAC regeneration. Compare with previous MHF experience at Pomona.	Contract	104b	Convery

MUNICIPAL POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1BB044 – COLD CLIMATE WASTE TREATMENT

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $157,000

Program Element Output: Cold climate waste treatment processes and systems which provide high levels of treatment compatible with the arctic environment. The principal effort will be the demonstration of central community facilities for native villages in Alaska — Alaska Village Demonstration Projects.

Program Element Director (PED):

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National Environmental Research Center
Environmental Protection Agency
College, AK 99702
Telephone: (907) 479–2251

Research Objective Achievement Plan 21ASF: **Alaska Village Demonstration Projects**

Objective: Installation, operation and evaluation of several facilities in various Alaskan villages in compliance with Section 113 of the Federal Water Pollution Control Act Amendments of 1972. A report to Congress on the success of the project with recommendations for a state-wide program.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASF-005	Operation for evaluation — Emmonak.	Contract	113	Latimer
21ASF-007	Operation for evaluation — Wainwright.	Contract	113	Latimer
21ASF-010	Safety modification at Emmonak.	Contract	113	Latimer

MUNICIPAL POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1BB045 - SOIL TREATMENT SYSTEMS

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $25,000
Contracts: NONE

Program Element Output: Non-conventional advanced waste treatment techniques for pollution control utilizing soils for the treatment of liquid wastes and sludges. Consideration will be given to other non-conventional treatment systems, such as aquaculture. Program emphasis will be placed on full-scale demonstration and evaluation, including system cost effectiveness.

Program Element Director (PED):

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Research Objective Achievement Plan 21ASJ: Biological/Ecological Municipal Wastewater Treatment/Control Systems

Objective: The product will consist of research reports and demonstration of systems for water pollution control technology. The effort will provide new and improved waste treatment alternatives which feature non-conventional biological process applications and will contribute to a sound ecological basis for disposal of treated wastewaters by utilizing specialized aquatic culture mechanisms.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ASJ-004	Determine the application potential for ecologically oriented waste treatment systems.	Research Grant	104b	Galegar

INDUSTRIAL POLLUTION CONTROL PROGRAM AREA

The objectives within the Industrial Pollution Control Program Area are to develop and implement full-scale demonstrations and field evaluations of new or improved waste treatment or economical control processes and measures resulting from new knowledge developed through EPA and/or external research efforts on industrial manufacturing pollution abatement methods.

Program efforts will be directed toward demonstrating the best practicable, best available and zero pollution control technology with emphasis on water reuse and product-by-product recovery. The industries of concern are the manufacturing industries as defined by the SIC (Standard Industrial Classification) Major Group 19—39.

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PROGRAM ELEMENT NO. 1BB036 - HEAVY INDUSTRIAL SOURCES

Funds: Available as of July 1, 1974 for support of listed Tasks:

Grants:	$1,498,300
Contracts:	$ 35,000

Program Element Output: New or improved methods for the abatement of water pollution caused by the discharge of wastes from heavy industries. These industries include, but are not limited to, metal and metal products, chemicals and allied products, petroleum and coal products, machinery and transportation equipment manufacturing, textile mill products, and rubber and plastic products, in addition to joint industrial/municipal waste sources. Program effort will be directed to achieve the best available economically achievable (BAT) control of pollutants, at minimum cost, and the technology to achieve closed cycle water reuse systems for industrial plant water management. Major emphasis will be placed on advancing technology to full-scale plant systems, and on integrated multi-media pollution abatement technology incorporating not only water reuse but product and by-product recovery from aqueous, air and solid residues to product total environmental control systems for industrial plants.

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PROGRAM ELEMENT NO. 1BB036 – HEAVY INDUSTRIAL SOURCES
Program Element Director (PED):

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Research Objective Achievement Plan 21AZN: Technology Research for the Elimination of the Discharge of Pollutants from the Iron & Steel, Machinery and Transportation Equipment Manufacturing and Metal Finishing (Except Electroplating) Industries

Objective: A spectrum of integrated applied research, development and demonstration activities culminating in engineering scale demonstrations of technically and economically viable methods for wastewater-multimedia pollution control. These activities will be translated for industry implementation through detail technical reports, seminars, design guidelines, and national standards of performance.

PROGRAM ELEMENT NO. 1BB036 – HEAVY INDUSTRIAL SOURCES

Research Objective Achievement Plan 21AZN

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZN-019	Research project on the managing and disposing of residues from environmental control facilities in the steel industry.	Research Grant	105	Davies
21AZN-020	Pilot demonstration on dissolved solids reduction in the treatment of automotive industry waste waters for process reuse.	Demo Grant	105	Davies
21AZN-022	Pilot Study to optimize and evaluate the use of electrolysis in the separation of emulsified oils and greases contained in waste waters from the machinery and transportation equipment manufacturing industries and metal finishing industries.	Demo Grant	105	Davies
21AZN-023	Pilot demonstration on a closed cycle electromembrane process for regeneration of spent sulfuric acid pickle liquor.	Demo Grant	105	Davies

Research Objective Achievement Plan 21AZO: Technology Research for the Elimination of the Discharge of Pollutants from the Nonferrous Metals and Electroplating Industries

Objective: Comprehensive final reports covering (1) state-of-the-art studies establishing the waste problems and abatement practices of the nonferrous metals and metal finishing industries and (2) projects involving the development and demonstration in actual plants of waste abatement technology which will achieve the objectives of the Federal Water Pollution Control legislation.

PROGRAM ELEMENT NO. 1BB036 – HEAVY INDUSTRIAL SOURCES

Research Objective Achievement Plan 21AZO

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZO-034	Development of reverse osmosis membranes into commercially available configurations for use on high or low as well as oxidizing metal finishing wastes.	Research Grant	104b	Lederman
21AZO-035	Novel evaporative system for treating metal finishing rinse wastes to purify the water and recover the chemicals.	Demo Grant	105	Lederman
21AZO-036	Electrodialysis demonstration for treating metal finishing rinse wastes to purify water for reuse and concentrate chemicals for return to the bath.	Demo Grant	105	Lederman
21AZO-037	Foam separation development study for removing toxic contaminants from nonferrous metal wastes.	Research Grant	104b	Lederman
21AZO-038	Development study on an ion exchange process for selectively removing toxic constituents from battery wastes.	Research Grant	104b	Lederman
21AZO-039	Development study on a process to recover heavy metals from metal finishing sludges.	Research Grant	104b	Lederman

Research Objective Achievement Plan 21AZP: **Technology Research for the Elimination of the Discharge of Pollutants From Petrochemical and Petroleum Refining Industries**

Objective: A spectrum of integrated applied research, development and demonstration activities culminating in engineering scale demonstration of tehnically and economically viable methods for wastewater-multimedia pollution control. These activities will be translanted for industry implementation through detailed technical reports, seminars, design guidelines, and national standards of performance. The relationship of each activity output to the national goal of elimination of polluting discharges will be identified and evaluated periodically in the form of progress seminars and state-of-the-art assessments to the degree possible, given legislative time contraints and available resources.

PROGRAM ELEMENT NO. 1BB036 – HEAVY INDUSTRIAL SOURCES
Research Objective Achievement Plan 21AZP

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZP-045	Demonstrate caprolactam production wastewater treatment technology.	Demo Grant	105	Galegar
21AZP-046	Demonstrate acetic acid production wastewater treatment technology.	Demo Grant	105	Galegar
21AZP-047	Demonstrate acrylonitrile production wastewater treatment technology.	Demo Grant	105	Galegar

Research Objective Achievement Plan 21AZQ: **Technology Research for the Elimination of the Discharge of Pollutants from the Inorganic and Miscellaneous Chemicals Industries**

Objective: Reports containing state-of-the-art technology; data on the development of new technology and its applicability; technical and economic data obtained on pilot and full scale demonstration units. Ultimate goal is to aid attainment of maximum recycle and minimum pollutants discharge to water and air, safe land disposal or recovery and reuse. Pertains to SIC 2812, 2813, 2815 (organic pigments & dyes, only), 2816, 2819, 283, 284, 2851, 286 and 289.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZQ-016	Demonstrate caustic concentration red mud reuse-alumina refining industry.	Demo Grant	105	Lederman
21AZQ-024	Demonstrate best available treatment technology for the soap and detergent industry.	Demo Grant	105	Lederman
21AZQ-031	State-of-the-art landfill (liners) impoundment techniques/ evaluation.	Research Grant	105	Lederman

PROGRAM ELEMENT NO. 1BB036 – HEAVY INDUSTRIAL SOURCES

Research Objective Achievement Plan 21AZR: **Technology Research for the Elimination of the Discharge of Pollutants from the Agricultural Chemicals Industry**

Objective: Documented demonstration of treatment process efficiency, design, and economics, accompanied by verification of effluent environmental compatibility where appropriate. Projects will be grouped to: (1) Identify special problem effluents, e.g., hazardous wastes, and attack those areas to meet legislative requirements; (2) Leapfrog best practicable technology (BPT) and best available technology/open cycle (BAT/OC) levels into best available technology/closed cycle (BAT/CC) and total environmental control (TEC) categories in response to the toxic/eutrophic nature of the wastes; and (3) Provide technology options at the BAT/CC level suitable for transfer into allied industrial programs. Timing of the described output will be keyed to the requirements of PL 92–500/72.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZR-019	Complete miniworks-full scale demonstration of the solvent extraction/Friedel-Crafts condensation process (BAT/OC) for high strength, low volume manufacturing wastewater or brines.	Demo Grant	105	Duttweiler
21AZR-020	Determine feasibility of the use of ion exchange resin adsorption with solvent regeneration and solvent recovery/recycle as a BAT/OC aqueous pesticide manfacturing waste treatment processes. Scale—bench to pilot. Hardware of interest include: Fixed/stirred beds; pulsed bed; and screw conveyer.	Demo Grant	105	Duttweiler

Research Objective Achievement Plan 21AZS: **Technology Research for the Elimination of the Discharge of Pollutants from the Rubber and Plastics Industry**

Objective: Reports summarizing the waste profiles for major segments of SIC 282 and 30 for program planning and as documented background for promulgating guidelines and standards. Engineering reports demonstrating technically and economically feasible treatment technology for the reduction and ultimate elimination of pollutant discharges for industry guidance and as documentation for effluent standards.

PROGRAM ELEMENT NO. 1BB036 – HEAVY INDUSTRIAL SOURCES

Research Objective Achievement Plan 21AZS

Technology development will strive to incorporate closed-loop methods, total control of air, water and solid waste generation.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZS-011	Develop and demonstrate tertiary treatment for synthetic rubber manufacturing wastewater and water recycle.	Demo Grant	105	Lederman
21AZS-019	Demonstrate control of nitrogenous wastes from manufacture of nitrogen-containing resins, plastics, or fibers.	Demo Grant	105	Lederman

Research Objective Achievement Plan 21AZT: Technology Research for the Elimination of the Discharge of Pollutants from the Textile Industry

Objective: The output from this ROAP will consist primarily of extramural project reports that will document examples of the application of waste treatment/abatement technology for the textile industry (SIC 22 & 23). Successful technology research will advance the technical and economic state-of-the-art for wastewater management in conformance with the technology levels that are mandated in PL 92–500. Administratively the ROAP activities include assessment/evaluation, monitoring, and development of the relevant projects which satisfy the EROS criteria.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZT-010	Extramural research/demonstration project to evaluate feasibility of synthetic size recovery and reuse from textile finishing operations.	Demo Grant	105	Duttweiler
21AZT-017	Extramural project to evaluate/ demonstrate "closed cycle" technology within EGD category 5.	Demo Grant	105	Duttweiler
21AZT-018	Extramural project to evaluate/ demonstrate "closed cycle" technology within EGD category 4.	Demo Grant	105	Duttweiler

PROGRAM ELEMENT NO. 1BB036 – HEAVY INDUSTRIAL SOURCES

Research Objective Achievement Plan 21AZV: **Technology Research for the Elimination of the Discharge of Pollutants from Joint Industrial/Municipal or Publicly Owned Treatment Works**

Objective: Applied research, development, and demonstration of technically and economically feasible methods of pollution control for the discharge of industrial wastes to municipal and/or joint industrial systems which may or may not include some municipal wastes. These activities will conclude with the presentation of detailed technical reports, seminars, design criteria, and national standards of performance. These ROAP milestones will be used to direct industrial/municipal concerns to attain the national goals as set forth in PL 92–500 using open cycle (OC), close cycle (CC), and total environmental control (TEC) concepts for planning purposes.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZV-029	State-of-the-art evaluation and literature survey of the amounts and quality of discharges from various industrial groupings into joint type treatment systems. Primary sources of information will be from in-house reviews, Office of Water Programs, effluent guideline reports, research reports, and general technical literature.	Contract	104b	Galeger

Research Objective Achievement Plan 21BET: **Technology Research for the Elimination of the Discharge of Pollutants from Miscellaneous Industry Sources**

Objective: Comprehensive final reports covering (1) state-of-the-art studies establishing waste problems and abatement practices for those industries in SIC categories 32, 38, and 39, as well as other miscellaneous industries; and (2) projects involving the development and demonstration in actual plants of waste abatement technology which will achieve the objectives of the Federal Water Pollution Control legislation.

PROGRAM ELEMENT NO. 1BB036 – HEAVY INDUSTRIAL SOURCES

Research Objective Achievement Plan 21BET

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BET-003	Develop a state-of-the-art report on pollution problems and advanced treatment needs of the photographic processing industry with partial resource support from Office of Water Programs (OWP).	Research Grant	104b	Lederman

PROGRAM ELEMENT NO. 1BB037 – LIGHT INDUSTRIAL SOURCES

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $1,444,000
Contracts: $ 90,000

Program Element Output: New or improved methods for the abatement of water pollution caused by the discharge of wastes from a variety of "soft" industrial sources. These industries include, but are not limited to, paper and allied products and food and kindred products. Program effort is being directed to achieve, at minimum cost, the equivalent of 85 to 99% removal of contaminants and the technology to achieve closed-loop systems for water reuse. Emphasis will be placed on fullscale demonstrations for by-product recovery and in-plant modifications.

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ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-006	Extramural support for program.	Contract	105	Lacy

Research Objective Achievement Plan 21AZX: **Technology Research for the Elimination of Discharge of Pollutants from the Wood Pulping Industry**

Objective: The program will develop technology to answer the needs of PL 92-500 for advanced waste treatment and control involving, ultimately, air, solid waste and waste effluent reuse and recycle systems. Pretreatment technology for municipal discharge will also be developed.

PROGRAM ELEMENT NO. 1BB037 – LIGHT INDUSTRIAL SOURCES
Research Objective Achievement Plan 21AZX

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZX-032	Advanced waste treatment (AWT) technology applied to process stream from sulfite pulping and bleaching.	Research Grant	105	Jaworski
21AZX-035	Demonstration of color removal by activated carbon or coagulant foam-flotation for neutral or acid sulfite pulping.	Research Grant	105	Jaworski
21AZX-046	Use of ultrafiltration for treatment of kraft unit process streams.	Demo Grant	105	Jaworski

Research Objective Achievement Plan 21AZY: **Technology Research for the Elimination of Discharges of Pollutants from the Paper and Paper Board Manufacturing Industry**

Objective: Directed to the requirements of PL 92–500, program activities will provide reports of in-house and extramural projects answering the 1977–83–85 needs of the Act for staged advancing waste treatment and control technology involving, ultimately, total environmental control technology encompassing air, solid waste and waste effluent reuse and recycle systems for integrated and non-integrated paper and paperboard mills. Pretreatment technology for municipal treatment will also be developed.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZY-032	Demonstration of irrigation disposal (spray, broad or ridge furrow) of secondary treated pulp and paper wastes.	Demo Grant	105	Jaworski
21AZY-033	Hyperfiltration or ultrafiltration processes applied to dissolved solids removal from recycled paper production wastes.	Demo Grant	105	Jaworski

PROGRAM ELEMENT NO. 1BB037 – LIGHT INDUSTRIAL SOURCES

Research Objective Achievement Plan 21AZZ: **Technology Research for the Elimination of Discharge of Pollutants from the Lumber and Wood Products Industry**

Objective: Principal processes in the lumber and wood products industry producing waste effluents are veneer and plywood production, hardboard, insulation board, wood treating, log storage, timber harvesting and logging road construction. Directed to the requirements of PL 92–500, program activities will produce reports of in-house and extramural projects answering the 1977–83–85 needs of the Act. The Office of Water Programs (OWP) guideline document will provide indications of deficiencies to be satisfied.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZZ-013	Demonstration of recycle of wet process hardboard wastewaters and the advanced wastewater treatment techniques necessary to prevent product deterioration.	Demo Grant	105	Jaworski
21AZZ-017	State-of-the-art review for logging road construction, with special reference to water quality.	Contract	105	Jaworski

Research Objective Achievement Plan 21BAA: **Technology Research for the Elimination of the Discharge of Pollutants from Heats, Fats, Edible Oils and Tanning Industries**

Objective: Reports on demonstration projects, pilot scale development projects, and in-house feasibility studies to document and disseminate the technology needed to accomplish the six steps listed below and thereby prove the technical and economical feasibility of no discharge of pollutants and/or closed-loop systems. (1) In-plant control by reduction of wastes from unit operations; (2) Solids recovery and disposal or utilization; (3) Treatment systems demonstrating discharge limitations; (4) Odor control on recovery and treatment systems; (5) Reuse of wastewaters and by-products in closed-loop systems; (6) Dissemination of technology developed and demonstrated.

PROGRAM ELEMENT NO. 1BB037 – LIGHT INDUSTRIAL SOURCES

Research Objective Achievement Plan 21BAA

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BAA-026	Demonstrate wastewater treatment system using advanced unit operations (e.g. microstrainer, flocculation and filtration) with disinfection for closed loop system.	Research Grant	105	Jaworski
21BAA-051	Demonstrate removal of suspended solids from meat packing plant effluent to meet best available technology (BAT) limits.	Research Grant	105	Jaworski

Research Objective Achievement Plan 21BAB: Technology Research for the Elimination of the Discharge of Pollutants from the Fruits and Vegetables, Sugar and Bakery Products Industry

Objective: Technical reports will be widely disseminated upon completion of all research and demonstration grants. Each grant being an integral part of a program developed to demonstrate Total Environmental Control (TEC) for the fruit and vegetable (1972 SIC 203), and sugar (SIC 205) processing industries. Seperate reports will be prepared for these SIC codes after demonstrating reports will be prepared for these SIC codes after demonstrating ZERO-Closed Cycle (CC). Upon demonstrating TEC seperate EROS objective reports by SIC codes will be prepared. Bakery and confectionary products (SIC 205 & 206) EROS objectives will be met through technology transfer.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BAB-037	Develop a low water use cut corn washer.	Research Grant	105	Jaworski
21BAB-038	Develop a low water use cleaning process that can be used in cleaning the majority of root crops.	Research Grant	105	Jaworski
21BAB-106	Demonstrate low liquid waste blanching of vegetables prior to canning and/or freezing (scale-prototype).	Demo Grant	105	Jaworski

PROGRAM ELEMENT NO. 1BB037 – LIGHT INDUSTRIAL SOURCES

Research Objective Achievement Plan 21BAC — Technology Research for the Elimination of the Discharge of Pollutants from the Grain Products and Beverages Industries

Objective: Individual final reports will be issued and disseminated on each research and demonstration grant project. Upon completion of the EROS objectives, reports will be prepared for the grain milling and beverage food processing segments delineating the alternatives and associated economics of closed-loop processing.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BAC-006	Development of treatment and by-product possibilities for solid wastes generated in the beverage industry (e.g. slops, mash, pomace, stillages).	Research Grant	105	Jaworski
21BAC-007	Demonstration of anaerobic trickling filter treatment of high-strength soluble wastes from beverage production.	Demo Grant	105	Jaworski
21BAC-018	Investigation of feasibility of recovering by-products from residual solids generated during wine production (stems, seeds, skins, pulp, etc.).	Research Grant	105	Jaworski

Research Objective Achievement Plan 21BAD: Technology Research for the Elimination of the Discharge of Pollutants from the Dairy Products, Seafoods and Miscellaneous Food Industries

Objective: Individual final reports will be issued and disseminated widely on each demonstration grant project. Upon completion of the EROS objectives, reports will be prepared for the dairy, seafood and miscellaneous food processing segments delineating the alternatives and associated economics of closed-loop processing.

PROGRAM ELEMENT NO. 1BB037 – LIGHT INDUSTRIAL SOURCES
Research Objective Achievement Plan 21BAD

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BAD-005	Demonstration of dissolved air flotation treatment of seafood processing waste (using LSA).	Demo Grant	105	Jaworski
21BAD-018	Develop new seafood processing operations that will reduce waste discharges.	Research Grant	105	Jaworski
21BAD-020	Evaluate pilot scale, low waste generating unit operations for the seafood processing industry.	Research Grant	105	Jaworski
21BAD-043	Develop and demonstrate package waste treatment plant for small seafood processors.	Demo Grant	105	Jaworski

PROGRAM ELEMENT NO. 1BB392 – THERMAL POLLUTION TECHNOLOGY

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $128,000
Contracts: NONE

Program Element Output: Technical information which will lead to more controlled means of dealing with waste heat from thermal power plants. Project efforts will lead to the development of advanced cooling techniques as well as the definition of beneficial uses for the waste heat, giving due regard to cost. Research and development data from field, laboratory and extramural studies will provide improved bases for developing and implementing thermal standards in addition to providing sites and engineering cost data on cooling techniques.

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PROGRAM ELEMENT NO. 1BB392 – THERMAL POLLUTION TECHNOLOGY

Research Objective Achievement Plan 21AZU: **Technology Research for the Elimination of the Discharge of Pollutants from the Steam Electric Power Industry**

Objective: Reports, papers, and other documentation of integrated applied research, development, and demonstration activities showing technically and economicallly viable methods for wastewater-multimedia pollution control. Target subjects include dry cooling systems on combined-cycle power plants, treatment/recycle/reuse of the various power plant effluents including SO_2 scrubber effluent and cooling tower blowdown, area requirements for cooling devices, backfitting economics, and discharge modification.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AZU-032	Demonstrate dry cooling towers on a moderate sized combined-cycle power plant.	Demo Grant	105	Jaworski

NONPOINT POLLUTION CONTROL PROGRAM AREA

The Nonpoint Pollution Control Program Area has as its general objective the development of information, decision-making tools and technology required to: (1) predict and assess the impact of pollutants from nonpoint sources on waters from various land use patterns; (2) determine the reduction in pollutant load which would result from implementation of specific nonpoint source controls and the costs of achieving these reductions to meet established water quality standards; (3) establish limits of reasonable controllability for nonpoint sources including an assessment of discharges resulting from mans activities and those which would occur in the absence of man's activities, and (4) establish specific control guidelines for nonpoint sources to serve as the basis for application of enforceable controls to local conditions.

Specific objectives are to develop cost effective nonpoint management systems, including alternatives appropriate for implementation in various geographical and geological areas with different climate and rainfall runoff patterns in the following areas:

(1) Agricultural activities including forestry and logging operations; agricultural runoff; irrigation return flows; confined animal feeding; aquaculture and disposal of nonagricultural sludges; to crop land. The development and demonstration mode will emphasize concepts which either maximize the potential for recycle or reuse (animal wastes, irrigation systems) or minimize adverse impact for "once through" systems (e.g., pesticide runoff). New and improved management concepts, fertilizer and pesticide formulations and application methods, and structural and equipment changes will be evaluated.

(2) Control of water pollution from active mining operations including the extraction process and those cleaning, milling, beneficiation processes necessary to produce a marketable product and abandoned mining sites. The objective is to allow mining to be carried on in the future without causing environmental degradation.

(3) Control of water pollution from hydrological modifications such as construction, dredging, landfill and water resources development. These activities have the common environmental impact of causing substantial changes in the local or area hydrologic patterns.

(4) Oil and hazardous material spills prevention, control and clean-up. The objective is to develop an array of countermeasures to contain spills, to prevent them from entering watercourses, and to control and remove those that reach waters and minimize damage to resources and to the water ecosystem. The variability of hazardous materials necessitates development of a wide range of countermeasures.

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NONPOINT POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1BB466 – COMPREHENSIVE NONPOINT SOURCE POLLUTION CONTROL

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $290,000

Program Element Output: Integration and coordination of the comparative nonpoint source pollution problems and control technology assessments. Program efforts will be concentrated on: the development of comprehensive comparative assessment of the nature, extent, distribution and variability of nonpoint water pollution sources in terms of their discharge of pollutants into surface waters on a basin, regional and National basis; an assessment of the effectiveness and cost/benefit of available technology and systems for control of nonpoint sources both within specific sources and from source to source; and, definition and prioritization of technology research needs for nonpoint sources to meet the Agency goals.

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Research Objective Achievement Plan 21BBQ: **Definition of Non-Point Pollution Control Technology Required to meet 1983 Water Quality Goals**

Objective: Provide a detailed assessment for significant non-point source revealed during the project, "National Assessment of Water Pollution from Non-Point Source" for which satisfactory data was found lacking; and were appropriate, develop necessary source loading functions or values. Assess the cost/benefit effectiveness of available Non-Point Source (NPS) control technology and by July 1, 1976, define the NPS control technology performance requirements necessary to meet the Agency's 1983 goals, including specific research and development objectives.

PROGRAM ELEMENT NO. 1BB466 – COMPREHENSIVE NONPOINT SOURCE POLLUTION CONTROL

Research Objective Achievement Plan 21BBQ

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BBQ-002	Preparation of loading functions and comprehensive assessments on the nature, extent, distribution and variability of non-point source pollution loads for significant NPS revealed to be lacking or inadequate, including sources impacting ground water quality.	Contract	104b	Heitzenrater
21BBQ-003	Prepare a report evaluating the effectiveness and cost/benefit of available technology and systems for control of NPS within specific sources and from source to source, including the definition of technology which is required to fill gaps in available systems and management/operational control for NPS sources.	Contract	104b	Heitzenrater

PROGRAM ELEMENT NO. 1BB039 – AGRICULTURAL SOURCES

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $1,217,000
Contracts: NONE

Program Element Output: Methods and management practices will be developed for abatement and control of pollution from agricultural sources. These sources include, among others, silvacultural operations, agricultural and natural runoff, irrigation return flows, animal feedlot operations. Program efforts will include: definition of the nature and extent of pollution from the various sources; development of management models and improved agricultural practices to mitigate the pollution; and development of criteria for promulgating specifications and guidelines for design and operation of control procedures.

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Research Objective Achievement Plan 21AYP: Development of Nutrient and Pesticide Loading Models and of Technical Criteria for Reducing Runoff of Agricultural Chemicals

Objective: Verified pesticide and plant nutrient mathematical models having watershed and gross river basin-wide predictive and simulative capability and nation-wide applicability (exclusive of irrigated agricultural areas) for all major pesticides and for the plant nutrients, nitrogen and phosphorus. The models will be used to formulate control methods to prevent pesticide and plant nutrient (N&P) pollution at the source and be used to assess the reduction in pollutant loading for any specified management, engineering practice or legal constraint.

PROGRAM ELEMENT NO. 1BB039 – AGRICULTURAL SOURCES

Research Objective Achievement Plan 21AYP

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYP-034	Definition and computer coding of a gross basin-scale pesticide and plant nutrient runoff model. Transport routines will be piggybacked on the hydrologic and sediment transport routines developed for the watershed-scale Pesticide and Plant nutrient runoff model.	Research Grant	105	Duttweiler
21AYP-035	Develop climatological data base for pesticide and plant nutrient runoff models.	Research Grant	105	Duttweiler
21AYP-060	Refine and verify the watershed-scale plant nutrient runoff model.	Research Grant	105	Duttweiler

Research Objective Achievement Plan 21AYR: **Improved Crop, Soil, and Water Management Methods to Reduce the Volume and Pollutant Content of Irrigation Return Flows**

Objective: Field demonstration of advanced techniques and complete salinity control packages in key basins in Regions VI, VIII, IX, and X. Research reports on legal and institutional restructuring studies required for implementation of improved water management practices. Management manuals for cost-effective control of pollutants in irrigation return flows, and effluent limitation guidance.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYR-020	Demonstrate on-farm water management practices related to irrigation and drainage which control the quantity and quality of IRF.	Research Grant	105	Galeger
21AYR-024	Evaluate and demonstrate tailwater management systems for salinity and sediment control in Region X – Pacific Northwest.	Research Grant	105	Galeger
21AYR-025	Demonstrate total salinity control program in the upper Rio Grande River Basin – Region VI.	Demo Grant	105	Galeger

PROGRAM ELEMENT NO. 1BB039 – AGRICULTURAL SOURCES

Research Objective Achievement Plan 21AYR

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYR-026	Evaluate economic constraints to implementation of BPT salinity control in western Regions.	Research Grant	104b	Galeger
21AYR-027	Evaluate institutional constraints to irrigation water management reform and salinity control in western Regions.	Research Grant	104b	Galegar
21AYR-029	Evaluate and demonstrate tailwater management systems for salinity and sediment control in Region IX – Central Valley California.	Research Grant	105	Galegar

Research Objective Achievement Plan 21AYS: Predictive Methods for Managing Irrigation Return Flows

Objective: Verified analytical mathematical computer model(s) with capability of predicting the effects of irrigation practices on local and downstream water quality, as well as the effects of changes in management practices. A completed model with program user's manual is required. One or more generalized analytical models will be developed applicable to all major irrigated regions. The model(s) shall include all significant management/control operations, dissolved solids, sediments, plant nutrients, and pesticides.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AYS-009	Workshop to critique an analytical computer model to predict the mineral quality of irrigation return flow in the Upper Colorado River Basin and integrate model with others. Establish applicability to basins where, IRP permits are required and salanity criteria are to be established.	Research Grant	105	Galegar

PROGRAM ELEMENT NO. 1BB039 – AGRICULTURAL SOURCES

Research Objective Achievement Plan 21BEO: Pollution from Silvicultural Activities

Objective: Techniques and guidelines to (a) determine the pollution loads attributable to silvicultural activities (watersheds and basins) and (b) assess the effectiveness of available control technology. Research and development strategy for continued development of new control technology or optimization of the implementation of existing technology.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BEO-002	Develop guidelines for determining pollutant loading functions for watersheds in the Northwest and Southeast.	Research Grant	105	Duttweiler

Research Objective Achievement Plan 21BEQ: Land Disposal of Animal Wastes

Objective: Series of waste management manuals describing methods of effiecient disposal of animal wastes on agricultural lands in such a manner so as not to cause any environmental problems. The manuals will be updated to include the new technology required to meet the 1983 goals.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BEQ-016	Demonstrate in moderate rainfall areas of Central Great Plains the effects on land and land runoff of disposal of cattle wastes which have received remedial/partial treatment.	Demo Grant	105	Galegar
21BEQ-019	Demonstrate effects of disposal of cattle and hog wastes which have received remedial/partial treatment on land and land runoff in geographical location, or soil types, and for treatment methods as delineated as necessary.	Demo Grant	105	Galegar

PROGRAM ELEMENT NO. 1BB039 – AGRICULTURAL SOURCES
Research Objective Achievement Plan 21BEQ

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BEQ-023	Evaluate the effect on the environment and characterize the pollutants produced by animals produced in a non-feedlot environment. Output will be supplied to Athens as input for agricultural chemical runoff model. Location for field investigations will be coordinated with Athens Lab.	Research Grant	105	Galegar
21BEQ-027	Establish runoff studies in southeastern United States to evaluate range or pasture conditions for dairy, swine, beef and turkey operations.	Research Grant	105	Galegar
21BEQ-028	Establish runoff studies in northeastern United States to evaluate range or pasture conditions for dairy, swine, and beef oprations.	Research Grant	105	Galegar
21BEQ-029	Establish runoff studies in western United States to evaluate range or pasture conditions for dairy, sheep, and beef operations.	Research Grant	105	Galegar

NONPOINT POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1BB040 – MINING SOURCES

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: See RFP when issued.

Program Element Output: Methods and management programs will be developed for the prevention, alleviation and abatement of water pollution caused by mineral extraction and mining activities. Program efforts will also be directed towards the assessment of new mining methods which will minimize environmental impact; this includes better preplanning and more effective mine closing techniques and other types of at-source control which will be applicable to both abandoned and active mines. Demonstration projects will be initiated to determine the engineering feasibility and the economic vectors associated with large scale treatment and at-source control methods. Technical reports and recommendations will provide a basis for development of planning and implementation programs as well as provide support to other Agency programs.

Program Element Director (PED):

Dr. Peter B. Lederman
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National Environmental Research Center
Environmental Protection Agency
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Telephone: (201) 548-3402

Research Objective Achievement Plan 21BDW: Pollution Control Technology for Abandoned/Inactive Mining Operations

Objective: Demonstration and documentation, in the form of manual of practices, of technical and operational feasibility, cost and effectiveness of water pollution control options for abandoned/inactive mining operations. A series manual of practices will be produced in FY 74, 78 and 80. Individual reports will be prepared for each demonstration.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BDW-028	Ores and minerals – assess problem and prepare research and development plan.	Contract	104b	Lederman

NONPOINT POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1BB041 – OIL AND HAZARDOUS MATERIALS SPILLS

Funds: Available as of July 1, 1974 for support of listed Tasks:

Grants:	$ 95,000
Contracts:	$586,000

Program Element Output: Technology will be developed for: the prevention of oil and hazardous materials spills; the emergency response and control of spills; and (3) the removal of spilled materials from water and terrestrial environments following accidental spills. Emphasis will be directed toward emergency response and control methods at industrial complexes and storage terminals, and during transportation. Methods will be developed for remote and congested areas, warm and cold climates, and fresh and marine waters. Spill control, counter-measure and removal techniques, will be demonstrated.

Program Element Director (PED):

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ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
TECH-007	Joint sponsorship of oil spill conference.	Research Grant	104b	Lederman

Research Objective Achievement Plan 21AVM: Hazardous Material Spill Emergency Response

Objective: Use-demonstrated systems and sets of procedures for implementation by emergency response teams or strike forces in determining: (1) how much and what hazardous materials (HM), at least by significant chemical class, has been spilled, (2) what the rate of travel and spreadout of the spill is with emphasis on protection of human and animal life, the environment, and public and private facilities, (3) what control/removal equipment should be mobilized, and (4) whether, ultimately, the cleanup is proceeding in an environmentally acceptable manner. Included will be manuals on effective response procedures, as well as updated information banks, disposable go/no-go test packets, protective clothing/equipment, dye marking techniques, etc. The ROAP simply provides the strike force with the essential, bare-bones tools for effectively coping immediately with the HM spill. Systems for in-stream and for aerial monitoring of HM spills will be developed through SRO's.

PROGRAM ELEMENT NO. 1BB041 - OIL AND HAZARDOUS MATERIALS SPILLS

Research Objective Achievement Plan 21AVM

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AVM-012	Define protective equipment requirements (clothing, breathing apparatus, etc.) to insure personal safety of those actively responding to HM spills, develop equipment specifications, and specify exisiting sources and/or design and fabricate suitable items of safety/protective equipment.	Contract	104b	Lederman

Research Objective Achievement Plan 21AVN: Hazardous Material Spill Control and Removal Measures

Objective: Demonstrated full-scale devices and methods to control and remove spilled hazardous materials, engineering drawings and specifications for their fabrication, manuals for their use, and reports detailing their development and evaluation. These will include back-pack devices to plug leaks and to foam-dike or gel spills on land, *in situ* treatment methods, rapidly transportable remote treatment systems and readily deployable removal devices for both flotable and settled materials which cannot be treated. The applicability of dispersants and chemical control measures will be determined. User manuals defining "best available" and "first generation" spill control technology will be prepared by January 1975 and July 1977, respectively.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AVN-024	Mobile spill treatment unit. Demonstrate the 250 gpm "dynamic reactor" - "magnetic separator" trailer unit in actual spill situation.	Contract	104b	Lederman
21AVN-028	*In-situ* spill treatment - optimize means of dispensing flotable mass transfer media and demonstrate the operational system in actual spill situations.	Contract	104b	Lederman
21AVN-035	*"In Situ* spill treatment. Demonstrate mass culturing of seed organisms and accelerated biological degradation in simulated spill situations.	Research Grant	104b	Lederman

PROGRAM ELEMENT NO. 1BB041 – OIL AND HAZARDOUS MATERIALS SPILLS

Research Objective Achievement Plan 21AVN

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AVN-041	Removal of spilled flotable hazardous materials. Evaluate "booming" devices developed for use on oil spills for effectiveness in controlling flotable hazardous materials.	Contract	104b	Lederman
21AVN-045	Manuals. Prepare User's Manual for delivery to Office of Water Programs that defines "best available technology" for hazardous materials spill control and removal.	Contract	104b	Lederman

Research Objective Achievement Plan 21AVO: **Separation and Recovery (On-Site) of Removed Spiller Hazardous Materials**

Objective: Operational systems/devices, reports, and manuals of procedures for: (1) The separation, recovery, and purification of spilled hazardous materials from the clean-up agents (carbon, resins, etc.) and any co-collected inert materials (mud, soil), (2) The safe and economical regeneration of the spent clean-up agents for re-use, and (3) The on-site detoxification/destruction of spilled hazardous materials and clean-up agents that cannot otherwise be salvaged or safely transported.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AVO-004	Develop/demonstrate small mobile unit for detoxifying by wet or dry chemical oxidation the non-recoverable hazardous materials collected at spill sites with physical/chemical entrapment of noxious off-gases and by-products.	Contract	104b	Lederman

Research Objective Achievement Plan 21BEA: **Inland Oil Spill Control Systems Integration and Evaluation**

Ojbective: Users' Manuals describing proper use and handling techniques of existing and improved oil spill control devices for inland use, and integration of these devices into effective systems.

PROGRAM ELEMENT NO. 1BB041 – OIL AND HAZARDOUS MATERIALS SPILLS

Research Objective Achievement Plan 21BEA

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BEA-003	State-of-the-art study at OHMSETT and spill sites to examine equipment and prepare presentations of techniques for control of inland oil spills.	Contract	104b	Lederman
21BEA-005	Develop users manuals for inland oil spill control based upon information developed from a preliminary review of existing technology and manuals.	Contract	104b	Lederman

PROGRAM ELEMENT NO. 1BB042 – HYDROLOGIC MODIFICATION

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $85,000
Contracts: NONE

Program Element Output: Procedures for optimum design, construction, and operation of hydrologic modification projects which will minimize environmental impact. Physical changes of watercourses for flood control, hydro-power, navigation, and irrigation; and local modifications of the water environment due to such things as dredging, construction, and landfill operations must be compatible with demands on our finite water resources for water supply, waste dilution, recreation, wildlife, and other beneficial uses. Reports and recommendations will provide a basis for development of planning and implementation programs as well as provide support to other Agency programs.

Program Element Director (PED):

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Environmental Protection Agency
9311 Groh Road
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Research Objective Achievement Plan 21BLG: Development and Demonstration of Fine Sediment Control Technology

Objective: Develop a series of report manuals on the feasibility and the cost of developing both construction management practices and a technology to reduce the erosion and transportation of fine sediment from construction activity sites. This would be followed by a demonstration of the management and the preferred development technology for specific construction sites through the U.S. in a variety of soil, vegetation, rainfall and slope conditions.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BLG-002	Initiate study of technology development required to minimize or remove fine sediment eroded and transported from construction sites.	Research Grant	104b	Davies

AIR POLLUTION CONTROL PROGRAM AREA

The primary objective of this program area is to assure the availability of control devices, processes, and approaches for control of air pollutants at their source. Programs range in scope from basic research and development activities through the design, construction, and operation of full-scale demonstration systems. Research, development, and demonstration programs are implemented principally through contracts with industrial firms and other governmental agencies. Approximately 10% of the research is conducted in in-house facilities. Portions of the more long-range and fundamental research and development activities are conducted through research grants with non-profit organizations, principally colleges and universities.

The air pollution control technology activities are currently grouped into four principal areas: (1) sulfur oxides, (2) nitrogen oxides, (3) particulates, and (4) hazardous and other pollutants.

A major portion of the program is devoted to research and development of technology for the control of sulfur oxide emissions. Historically, this research has focused on control of sulfur oxide emissions from electric power generating plants. More recently, increased attention is being given to the control of industrial combustion and industrial process sources.

Activity on nitrogen oxide control research is expanding rapidly to support control technology needs and regulatory requirements. The primary thrust of the ongoing nitrogen oxide research and development is in the area of combustion control. Increasing attention is being given to nitrogen oxide effluent treatment processes.

Particulate control research and development must cope with the needs for fine particulate control technology and improved and more economic conventional technologies. Reliable methods for measuring fine particulate as well as the development of high efficiency methods and equipment for controlling fine particulates in the 0.05 to 3.0 micron size range are being emphasized.

The hazardous and other pollutant control category embraces control technology for all air pollutants not classified within one of the above three categories. This includes the development of technology for control of hydrocarbons from stationary source, halides, and similar pollutants. Special emphasis is being placed on the control of hazardous and potentially hazardous pollutants including mercury, beryllium, asbestos, cadmium, vanadium, chromium, lead, etc.

Program Area Manager (PAM):

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AIR POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1AB012 – PARTICULATE CONTROL

Funds: Available as of July 1, 1974 for support of listed Tasks:

Grants:	$ 24,000
Contracts:	$1,935,000

Program Element Output: Effective and practical processes and methods for the prevention or control of particulate air pollution. Program efforts will be to: (1) upgrade the principal present control techniques (including electrostatic precipitation, fabric filtration, and wet scrubbing) to satisfactory emission control levels; and (2) develop new technology to cope with fine particulate emissions. Modified and new devices will be tested at a pilot scale, and successful collection techniques will then be demonstrated at full scale on industrial emission streams.

Program Element Director (PED):

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ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-007	Long Range Program Planning and Review	Contract	104	Harrington
PEMP-009	Short Quick Term Response	Contract	104	Harrington

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PROGRAM ELEMENT NO. 1AB012 – PARTICULATE CONTROL

Research Objective Achievement Plan 21ADJ: Conventional Effluent Treatment Technology Development

Objective: This ROAP provides for the solicitation, evaluation, development, and pilot scale demonstration of improved conventional particulate collection equipment and technology for the removal of particulates from point and area sources. Conventional particulate removal equipment includes, but is not necessarily limited to, fabric filters, scrubbers and electrostatic precipitators. Improvements will take the form of reduced capital and operating costs, extended applicability, improved collection efficiency, and improved operational reliability.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADJ-005	To determine the most efficient method of introducing energy into a scrubber system for high efficiency fine particle collection.	Contract	104	Burchard
21ADJ-093	To define trapping and reentrainment losses as to total mass and particle size distribution of the material lost. Also determine what factors influence trapping and reentrainment losses.	Contract	104	Burchard

Research Objective Achievement Plan 21ADK: Particulate Control Engineering Analysis

Objective: Provide a comprehensive engineering analysis of the Particulate Control Program. The analysis will include an overview appraisal of the current and future particulate emission problem, a comprehensive evaluation using a common methodology of particular processes which may control particulate emissions, an accumulation of a data base necessary for EPA to set equipment standards for particulate control, and development of a methodology which permits rational management decisions to be made to guide the direction of the Particulate Control Program. This permits an optimum allocation of resources for the development of air pollution control technology.

PROGRAM ELEMENT NO. 1AB012 - PARTICULATE CONTROL

Research Objective Achievement Plan 21ADK

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADK-031	Develop an engineering analysis and pollution source priority methodology. The methodology will be used to evaluate the impact of changing EPA criteria (such as new health effects findings) on Control Systems Laboratory (CSL) programs and priorities.	Research Grant	104	Burchard
21ADK-032	Establish in-house MIS for research and development Program.	Contract	104	Burchard

Research Objective Achievement Plan 21ADL: Fine Particulate Control Technology Development

Objective: Development through pilot scale of at least three broadly applicable methods or devices for control of fine particle (001–3.0 microns) emissions. Pilot scale demonstration of systems on several typical priority hazardous particle sources. Documentation of the relative technical and economic feasibilities of various systems. Development of at least one practical, manual particle-sizing method and one continous method for fractional efficiency determination and control device performance evaluation.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADL-002	Demonstrate Flux Force/Condensation scrubber systems for controlling fine particle emissions from several industrial processes. All demos will be at pilot scale.	Contract	104	Burchard
21ADL-023	To develop and demonstrate wet ESP for collection of fine particles from industrial sources and for joint collection of fine particles and gaseous pollutants.	Contract	104	Burchard
21ADL-037	Establish and publish procedures for optimum operation of particulate removal equipment to assure continued high performance on fine particulate control.	Contract	104	Burchard

PROGRAM ELEMENT NO. 1AB012 - PARTICULATE CONTROL

Research Objective Achievement Plan 21ADL

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADL-038	To determine the importance of particle/liquid interfacial properties to collection of fine particle by wet systems. Is important to develop methods of modifying these properties to improve collection.	Contract	104	Burchard

Research Objective Achievement Plan 21ADM: Effluent Treatment Technology Characterization

Objective: This ROAP will result in the evaluation and documentation of the relative capabilities and limitations of particulate control devices. This information will permit selection by equipment users of collection systems that are technically and economically optimum for specific applications.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADM-024	Construct a mobile ESP unit and test the operation on a variety of industrial sources to obtain true operating data for efficiency and cost documentation for the control of specific fine particulates.	Contract	104	Burchard
21ADM-028	To obtain data on particle collection efficiency (both mass, and fractional) of industrial ESPs.	Contract	104	Burchard
21ADM-029	To obtain data on particle collection efficiency (both mass and fractional) of industrial wet scrubber systems and to develop all necessary math models, correlations, etc., necessary to generalize the data to installations not tested.	Contract	104	Burchard

PROGRAM ELEMENT NO. 1AB012 – PARTICULATE CONTROL

Research Objective Achievement Plan 21BKP: **Industrial Fine Particulate Control**

Objective: Technical reports on the characterization of the performance, including engineering and economic parameters, of commercially available particulate control equipment to control particulate emissions, with emphasis on control of fine particulate material, for a variety of emission types. These technical reports will form a data base on the particulate control capability of the commercially available equipment that will serve: (1) as a basis for setting particulate control standards, (2) for enforcement of standards, (3) in providing technical assistance to States, regulatory agencies, and users, and (4) to serve as a basis for assessing research and development requirements.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BKP-005	Research investigation of commercial particulate control equipment.	Contract	104	Stenburg

AIR POLLUTION POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1AB013 – SO$_x$ CONTROL

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $2,891,000

Program Element Output: Technology for the control of sulfur oxide emissions with technical and economic characteristics capable of providing levels of control necessary to meet ambient air quality and new source performance standards. The principle approaches will include flue gas treatment processes and fuel cleaning techniques. Control technology development and demonstration will address both the control of major point sources and smaller area sources. Primary attention will be given to regenerative processes since they offer technical and economic advantages for power generation, conserve natural resources and result in reduced waste products.

Program Element Director (PED):

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ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-003	Future Technology Evaluation.	Contract	104	Harrington
PEMP-005	Environmental Impacts.	Contract	104	Harrington
PEMP-006	Advanced Energy Systems Review.	Contract	104	Harrington
PEMP-008	Sulfate Planning and Management Study.	Contract	104	Harrington

PROGRAM ELEMENT NO. 1AB013 – SO_x CONTROL

Research Objective Achievement Plan 21ADC: Industrial Process Control

Objective: A series of research and engineering reports that will define the status and economics of control technology for various industries such as smelters, pulping, and sulfuric acid. The results of studies up to the pilot plant stage for pulp plants and petroleum refineries. The demonstration of results of a low pollution emitting retrofitted Kraft pulping recovery furnace. A series of Research and Engineering Reports that will provide the bases to allow the requirement for permanent control for non-ferrous smelters, and the background for emission limitations required for an ultimate sulfate standard.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADC-061	Undertake feasibility studies and prepare preliminary designs on a smelter-by-smelter basis, of systems that would control lean sulfur dioxide bearing streams and thereby provide EPA with the data that would allow it to disallow the use of supplemental control and replace it with permanent controls.	Contract	104	Burchard

Research Objective Achievement Plan 21ADD: Clean Fuel Technology Development

Objective: Effective SO_x control methods resulting from environmentally sound processes for clean fuel production and from fuel gas desulfurization will be demonstrated. These processes include gasification/desulfurization of residual oil (CAFB); high temperature clean-up of gasification products; clean low-BTU gas from coal. These and other methods under development and evaluation can contribute to a control strategy applicable to industrial, commercial, and area sources.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADD-041	Evaluation of existing known control techniques and control methods under development to determine applicability to all systems and environmental effects.	Contract	104	Burchard

Research Objective Achievement Plan 21ADD

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADD-110	Establish the mechanism and capabilities of the reaction system employed in the KVB Processes for chemical removal of sulfur from coal and fuel oils.	Contract	104	Burchard
21ADD-111	Compilation of chemistry on groups and specific pollutants (such as sulfur, trace elements) and evaluate new approaches for their removal.	Contract	104	Burchard

Research Objective Achievement Plan 21ADE: Sulfur Oxide Control Engineering Analysis

Objective: Provide a comprehensive engineering analysis of the SO$_x$ control program. The analysis will include an overview appraisal of the current and future SO$_x$ emission problem, a comprehensive evaluation using common methodology of particular processes that may control SO$_x$ emissions, formation of a data base necessary for EPA to set equipment standards for SO$_x$ control, and development of a methodology to make possible rational management decisions for guiding the direction of the SO$_x$ control program. This permits optimum allocation of resources for the development of air pollution control technology.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADE-011	Perform a statistical survey and review of major Control Systems Laboratory (CSL) programs and projects. To aid in-house program appraisals.	Contract	104	Burchard

Research Objective Achievement Plan 21AFF: Coking Plant Emission Control Demonstration

Objective: Data and information, on control of emissions from charging, pushing and quenching, will be provided for use by EPA, State and local regulatory agencies for establishment and enforcement of standards and by industry as a basis for decision making on applicability to their cokemaking plants. Products of the demonstration will include, but not be limited to: (1) engineering analysis of the demonstration results; (2) process specification manuals including process drawings; (3) operating and test data journals.

PROGRAM ELEMENT NO. 1AB013 – SO_x CONTROL

Research Objective Achievement Plan 21AFF

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AFF-012	Develop guidelines as to applicability, retrofitting and construction for coke charging and pushing systems to assure that results of demonstration projects are fully applicable to all other coke batteries whose emissions must be controlled.	Contract	104	Burchard

Research Objective Achievement Plan 21AFI: Wellman Power-Gas Process Demonstration

Objective: The Wellman-Power Gas process is expected to be demonstrated in a form applicable to new and existing coal-and oil-fired utility and industrial combustion sources before the end of 1976. Among others, products of the program will include: (1) engineering analyses of the demonstration results; (2) process specification manual, including process drawings; (3) an operating and test data journal; and (4) a critique of demonstration procedures.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AFI-009	Examine methods of purge reduction through use of (1) improved oxidation inhibitors, (2) modification of operating conditions, and (3) evaluation of equipment for regeneration of sulfate to recyclable materials.	Contract	104	Burchard

Research Objective Achievement Plan 21AFJ: Coal Cleaning

Objective: Characterization of the cleanability of U.S. coal by physical and chemical techniques. Accelerate engineering and applicability of coal cleaning to meet present standards. Improved physical cleaning technology for fine sized coal and pilot-prototype demonstration of chemical coal cleaning combined with mechanical coal cleaning. Maximum pollutant control will be achieved.

PROGRAM ELEMENT NO. 1AB013 – SO_x CONTROL
Research Objective Achievement Plan 21AFJ

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AFJ-030	To assess the technical feasibility and establish independent economic reviews of major processes for chemical removal of sulfur from coal.	Contract	104	Burchard
21AFJ-040	Modification and operation of an integrated process development unit in order to optimize reaction conditions for maximum control and removal of impurities from coal.	Contract	104	Burchard
21AFJ-100	Cooperatively support demonstration of the high-sulfur combustor.	Contract	104	Burchard

Research Objective Achievement Plan 21BBZ: Sulfur Oxide Area Source Control Technology

Objective: All technologies for control of SO_x from area (non-utility by end use) sources will be assessed. Commercial scale add-on devices and processes will be developed and/or utilized in the demonstrations. In addition to add-on devices, alternate fuels (such as methanol, low BTU gas, LGP, and low sulfur western coal) and clean conversion techniques (such as fuel cells, catalytic combustion, utilizing electricity, and increasing fuel utilization efficiency) will be assessed, developed, and demonstrated.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BBZ-003	Develop a package sorption unit which can be factory assembled and used in the field for small scale emissions control.	Contract	104	Burchard

PROGRAM ELEMENT NO. 1AB013 – SO_x CONTROL
Research Objective Achievement Plan 21BBZ

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BBZ-004	Formation and implementation of a one year test program to evaluate technical and economic feasibility of the Mag-Ox process installed on a coal-fired industrial area source boiler.	Contract	104	Burchard
21BBZ-005	Laboratory feasibility investigations and pilot scale evaluation for promising flue gas desulfurization methods applicable to industrial/area combustion sources.	Contract	104	Burchard
21BBZ-006	Monitoring and assessment of ongoing and planned research and development within this ROAP and in industry and compliance technology for SO_x control from industrial/area sources.	Contract	104	Burchard
21BBZ-007	Provide a series of mini-demonstrations of the environmentally sound use of low-sulfur western coal in small and intermediate size boilers.	Contract	104	Burchard
21BBZ-010	Assess environmental and economic impacts of industrial equipment to produce, store and transport methanol (and its raw materials). Estimate energy utilization efficiency for coal – producer gas – methanol – electricity (vs. existing techniques). If beneficial and feasible, develop 5-kilowatt cell.	Contract	104	Burchard

PROGRAM ELEMENT NO. 1AB013 - SO_x CONTROL
Research Objective Achievement Plan 21BBZ

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BBZ-011	Estimate the following impacts of substituting electricity for fuel in the residential, commercial, and small industrial sectors: environmental impact, energy utilization efficiency, costs, and rate of conversion to electricity. Definition of tasks needed to maximize rapidity of application.	Contract	104	Burchard
21BBZ-012	Determine present conservation technology by searching literature and contacting housing industry leaders, trade associations, and government agencies. Asess air impact and the need for additional development or demonstration work. If needed, outline five-year program.	Contract	104	Burchard
21BBZ-013	Examine major alternate sources of fossil fuels for their applicability and environmental impact. The objective of this area is to evaluate the processing problems and environmental degradation that ensue, control requirements, and potential applicability in light of identified problems. Initial consideration would be given to methanol, LNG, H_2.	Contract	104	Burchard

PROGRAM ELEMENT NO. 1AB013 – SO_x CONTROL

Research Objective Achievement Plan 21BBZ

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BBZ-014	Evaluate the impact that clean fuel conversion systems would have upon controlling emissions from combustion sources. Although utilities would be considered, primary interest would be in area sources where natural gas has been used but now coal is being considered due to lack of gas. Such industries as brick manufacturing, iron and steel, automobile, etc. would be prime candidates. Additional environmental problems will be identified and evaluated.	Contract	104	Burchard
21BBZ-016	Analytical support services	Contract	104	Burchard

Research Objective Achievement Plan 21BKR: Fuel Cells and New Fuels Technology Development

Objective: Provide an assessment of the potential environmental impact of utilizing fuel cell technology and new fuels on pollutant emissions. Fuel cell technology for mobile and stationary applications will be developed and demonstrated. Emission controls required for manufacturing and utilizing new fuels will be developed.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BKR-002	Fuel cell technology will be assessed and the overall program will be developed.	Contract	104	Burchard
21BKR-003	Alkaline hydrogen fuel cell.	Contract	104	Burchard
21BKR-004	Develop a total energy system for dwellings and commercial establishments in the range of 5–100 kilowatts.	Contract	104	Burchard

PROGRAM ELEMENT NO. 1AB013 – SO_x CONTROL
Research Objective Achievement Plan 21BKR

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BKR-005	The objectives are to reduce heat rate to 7500BTU/kilowatt hour, increase cell life, and reduce cost to $150/kilowatt hour.	Contract	104	Burchard
21BKR-006	This will support all fuel cell development and will include standardization of measurement methods.	Contract	104	Burchard
21BKR-007	Characterize optimum solid and liquid electrolytes such as zirconias, aluminas, sulfuric acid, phosphoric acid, fluorosulfonic acid, and aqueous and non-aqueous buffers and bases.	Contract	104	Burchard
21BKR-008	Develop a solid electrolyte cell to be used in conjunction with a low-BTU gasifier.	Contract	104	Burchard
21BKR-009	Develop a methyl alcohol fuel cell and a MeOH reformer to be used in conjunction with a hydrogen cell.	Contract	104	Burchard

Research Objective Achievement Plan 21BLH: Disposal of Waste Sludges from FGD Scrubbing Processes

Objective: Demonstrated technology, both newly developed and adapted from other waste disposal pratices, which is documented in the form of reports and design/operation manuals for the reliable, effective, economic, and environmentally acceptable disposal of wastes generated by FGD processes. technology will include considerations of the impact of raw sludge disposal, stabilization processes, and the impact of disposal or "reuse" of the stabilized product, and promising areas of resource recovery.

PROGRAM ELEMENT NO. 1AB013 - SO_x CONTROL
Research Objective Achievement Plan 21BLH

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BLH-004	Raw sludge disposal field study Objective I: Liner life evaluation. Evaluate life of synthetic and bitumen liners in contact with soil and sludge over a long time period. Objective II: Evaluate performance of clay and soil admixtures as liners for raw leachate pond by collection, quantification, and characterization of leachates. Objective III: Evaluate methods for treatment of sludge liquors as generated by lined sludge ponds.	Contract	104	Stenburg
21BLH-002	Program support and engineering analysis: a. To compile and keep current a listing showing all fossil fuel power plants, type of scrubber systems, and methods of disposal. b. To provide recommended procedures and methods necessary to carry out various types of field surveys in the following tasks. c. To assimilate data from all ongoing research projects, government and private sponsored, and prepare annual reports to include defensible data analysis to prove or disprove current thinking and logic including economic assessment. d. To assess the current research, both government and private, and relate to tasks in this ROAP with recommendations for re-prioritizing, deleting, or adding in order to accomplish stated objective. e. To develop a design manual that can be used by government and industry to solve the problem of disposing of FGD sludges and including site utilization.	Contract	104	Stenburg

PROGRAM ELEMENT NO. 1AB013 – SO_x CONTROL
Research Objective Achievement Plan 21BLH

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BLH-003	Characterization and determination of sludge pollutant potential: a. Review and compile measurement methods. b. Sludge composition sampling program. Obtain sludge and liquor samples from various fuel sources and characterize chemically and physically. c. Pollutant screening studies. Laboratory study on leachability, leachate formation, transport, transformation, attenuation, natural oxidation, and microbial activity. d. Site monitoring program. Devise monitoring scheme and obtain pollutant information. Identify items for which field monitoring techniques or instrumentation are not available. Determine microbial activity and site recovery information.	Contract	104	Stenburg
21BLH-005	Field test of selected fixation process. Small scale field tests for fixation of FGD sludge with power plant wastes and lime.	Contract	104	Stenburg
21BLH-006	Investigate and development of sludge sulfite oxidation: Phase I: Verify feasibility and fix design basis through lab and equilibrium theory. Phase II: Preliminary design study and cost estimates. Phase III: Detail design and construction of pilot plant facility. Phase IV: Operation and Testing (a.) optimization tests (b) routine operating test development.	Contract	104	Stenburg

AIR POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1AB014 – NO_x CONTROL

Funds: Available as of July 1, 1974 for support of listed tasks:
Grants: NONE
Contracts: $797,000

Program Element Output: Effective and practical processes and methods for the prevention of NO_x emissions from stationary sources by the modification of combustor design and combustion processes. The goal is to develop and demonstrate technology which will provide the capability of achieving 75% control of NO_x emissions from major point sources.

Program Element Director (PED):

Dr. John Burchard
Control Systems Laboratory
National Environmental Research Center
Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 688-8146

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-008	Short quick term response.	Contract	104	Harrington

PROGRAM ELEMENT NO. 1AB014 – NO_x CONTROL

Research Objective Achievement Plan 21ADG: **Combustion Control Technology Development (NO_x)**

Objective: Combustion control technology for control of NO_x and combustible emissions from utility boilers and gas turbines will be developed. This ROAP will provide for technology evaluation and development up to but not including commercial scale demonstration. Specific products from this ROAP will include: reports detailing the state of the art in combustion control; design criteria for low-NO_x burner designs, application guidelines, designs and retrofit costs for new and existing utility boilers and turbines.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADG-058	Define and compare methods for obtaining particulate mass data and particle size distribution data. Techniques will be compared from information contained in the literature supplemented by performing tests. The end products will be a report which defines the techniques and recommends the best for use in stack sampling emissions from coal, oil, and gas-fired boilers.	Contract	104	Burchard

Research Objective Achievement Plan 21ADI: **Nitrogen Oxide Control Engineering Analysis**

Objective: Provide a comprehensive engineering analysis of the NO_x control program. The analysis will include an overview appraisal of the current and future NO_x emission problem, a comprehensive evaluation using a common methodology of particular processes which may control NO_x emissions, an accumulation of a data base necessary for EPA to set equipment standards for NO_x control, and development of a methodology which permits rational management decisions to be to guide the direction of the NO_x control program. This permits an optimum allocation of resources for the development of air pollution control technology.

PROGRAM ELEMENT NO. 1AB014 – NO_x CONTROL

Research Objective Achievement Plan 21ADI

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ADI-034	Review of Control Systems Laboratory (CSL) Analytical Scheme. Provide a panel of acknowledged experts in analytical chemistry to review the CSL analytical scheme. This will assure the scheme's quality and provide a confidence in the results of CSL programs.	Contract	104	Burchard
21ADI-036	Basic NO_x Absorption Studies. Perform an information search and basic studies of liquid and solid absorbers and adsorbers of NO_x. Consider both low and high temperature NO_x removal. This is an attempt to identify novel effluent treatment technology for NO_x.	Research Grant	104	Burchard

Research Objective Achievement Plan 21BCC: Control Technology Development and Environmental Impact (NO_x)

Objective: The results from operations under this ROAP effort will be documents completely describing the results of research and development programs, field tests, and information surveys. Collectively, these will describe the state-of-the-art for controlling NO_x and carbonaceous pollutant emissions from industrial combustion, stationary engines, and commercial/residential combustion systems. In addition, a number of hardware designs and design criteria will be available, for guidance to the respective industry in developing and producing low emission combustion equipment. This combined hardware and documentation will be used by Federal, State and Local agencies to set up pollution control standards and by industry to achieve conformity with these standards.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BCC-017	To apply an optical analytical technique to measurement of local flame properties for characterization of large turbulent diffusion flames.	Contract	104	Burchard

PROGRAM ELEMENT NO. 1AB014 – NO_x CONTROL
Research Objective Achievement Plan 21BCC

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BCC-018	Establish the mechanisms of formation of NO_x, soot and related pollutants in flames; to determine combustion characteristics which will prevent formation of these pollutants; and to establish the mechanisms of carbon burn-out.	Research Grant	104	Burchard
21BCC-025	To establish burner design criteria for simultaneous firing of two fuels (one high sulfur, one low) for sulfur oxides control with high efficiency and low pollutant emissions.	Contract	104	Burchard
21BCC-028	To develop design criteria for a low temperature, catalytic combustion system to eliminate emissions of NO_x, CO, UHC and fine particulate and to assess the potential for use in a variety of stationary point and area sources.	Contract	104	Burchard
21BCC-030	Evaluate and optimize advanced and novel combustion control techniques for control of pollutant emissions from fossil and fossil/waste fuel combinations using a highly versatile multi-burner, multi-fuel experimental furnace.	Contract	104	Burchard
21BCC-031	To develop combustion system design criteria for use of alternate clean fuels in area sources and to assess the total environmental impact of use of these fuels including potential for new classes of pollutant emissions.	Contract	104	Burchard

PROGRAM ELEMENT NO. 1AB014 – NO_x CONTROL
Research Objective Achievement Plan 21BCC

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BCC-047	Characterize the emissions from and develop emission factors for non-steam raising industrial process combustion equipment (e.g., industrial process furnaces, kilns, etc.), internal combustion (I.C.) engines, and gas turbines. Determine the state-of-the-art in combustion control for this equipment and determine the effect of combustion modification techniques on pollutant emissions and equipment operations.	Contract	104	Burchard
21BCC-048	Provide technical management and engineering support services for the review and evaluation of program or project areas or portions thereof; for the statistical review and analysis of data; for the assessment of research and development needs; to evaluate results; progress or proposed changes in direction and recommend course of action; to provide preliminary evaluation of environmental impact of control technology and to assist with technology transfer, etc.	Contract	104	Burchard

AIR POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1AB015 - CONTROL TECHNOLOGY - OTHER POLLUTANTS

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $1,303,000

Program Element Output: Control technology for air pollutants such as hydrocarbons, halides, carcinogens, carbon monoxides, hazardous and other pollutants which are deemed to be significant and require source and area control. Development and demonstration of control technology for odors, products of incineration, and hazardous and other pollutants from industries including graphic arts, phosphate rock, organic chemicals, glass and ceramics, aluminum, paint and varnish, petrochemicals, electrochemicals, food and other miscellaneous industries will be undertaken.

Program Element Director (PED):

Dr. John Burchard
Control Systems Laboratory
National Environmental Research Center
Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 688-8146

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-003	Short term quick response requests.	Contract	104	Harrington
PEMP-004	Planning assistance for development and maintenance of strategic research and development (RD&D) plan for control capability data into definition of future control requirements by source and pollutant.	Contract	104	Harrington
PEMP-005	Intermedia effects study.	Contract	104	Harrington
PEMP-007	Alternate fuels study.	Research Grant	104	Harrington

Research Objective Achievement Plan 21AFA: **Control of Specific Hazardous Pollutants**

Objective: A source assessment document will be prepared for each source type. This document will contain sufficient experimentally verified data to permit a decision on the extent to which the source should be controlled. Control technology will be developed as required. This will result in a second product—documents containing descriptions of field verified techniques for controlling emissions from each source to the extent required. Industrial sources covered by this ROAP include sulfuric acid plants, nitric acid plants, glass manufacture, fertilizer manufacture, and other processors of inorganic materials.

Research Objective Achievement Plan 21AFA

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AFA-106	Develop control technology for inorganic processes.	Contract	104	Burchard

Research Objective Achievement Plan 21AFH: Engineering Analysis—Hazardous and Other Pollutant Control

Objective: A comprehensive engineering analysis of the Hazardous and Other Pollutants Control Program. The analysis will include an overview appraisal of the current and future hazardous and other pollutants emission problem, a comprehensive evaluation using a common methodology of particular processes that may control hazardous and other pollutants emissions, an accumulation of a data base necessary for EPA to set equipment standards for hazardous and other pollutants control, and development of a methodology that permits rational management decisions to be made to guide the direction of the Hazardous and Other Pollutants Control Program.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AFH-051	Develop a comprehensive chemical analysis scheme to screen for pollutants of potential concern in samples collected by Control Systems Laboratory (CSL) - supported projects. In addition the review of proposed scheme(s) by CSL personnel, outside expert review will provided.	Contract	104	Burchard
21AFH-052	To provide contract assistance in assuring that sufficient and appropriate data are collected by Control Systems Laboratory (CSL) projects and compiled in a manner to support hardware-type (control equipment-type) new source performance standards.	Contract	104	Burchard

Research Objective Achievement Plan 21AQR: Iron and Steel Industrial Process Control Development

Objective: Iron and steel industrial process emission controls will be developed to the point at which the decision to demonstrate can be made. Specific products will include (1) engineering analysis of all technology development results; (2) technology specifications and drawings; (3) a journal of all operating and test data collected; and (4) recommendations for further work.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AQR-040	Source sampling of smaller sources. The highest priority sources will be sampled to verify and amplify previous data.	Contract	104	Burchard

Research Objective Achievement Plan 21AUY: Control Technology for Industrial Operations

Objective: Control technology adequate to establish NSPS or meet AAQS will be identified or developed. Emission data required by standards and enforcement will be generated. Thorough evaluation of alternative technology will promote the utilization of the most economically and technically favorable control methods.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AUY-060	Identify fugitive emission sources in iron foundries, non-ferrous smelting operations, and integrated iron and steel plants. Categorize in terms of quantity, type of emission, toxicity, etc., and rank sources with respect to potential impact of control.	Contract	104	Burchard
21AUY-070	Identify on a qualitative and semi-quantitative basis emissions from iron ore pelletization processes, the present effectiveness of control, and the necessity for further development of control technology.	Contract	104	Burchard

PROGRAM ELEMENT NO. 1AB015 - CONTROL TECHNOLOGY - OTHER POLLUTANTS

Research Objective Achievement Plan 21AUY

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AUY-071	Identify atmospheric emissions from iron ore mining and iron ore beneficiation processes. From this study the need for further emission control technology will be determined.	Contract	104	Burchard
21AUY-090	To identify and quantify hazardous emissions from various metallurgical processes, elemental analyses will be performed on samples taken during ongoing coke making, iron foundry, and sinter plant tasks. In some cases material balances will will be performed on the hazardous materials identified.	Contract	104	Burchard
21AUY-095	Fugitive emission process measurement research and development (R&D) task process measurements for fugitive emissions. Develop improved procedures for measuring fugitive emissions for the ferrous and non-ferrous metals and other industries.	Contract	104	Burchard

Research Objective Achievement Plan 21AVA: Control of Open Sources

Objective: A source assessment document will be prepared for each source type. This document will contain sufficient experimentally verified data to permit a decision on the extent to which the source should be controlled. Control technology will be developed as required. This will result in a second product—documents containing descriptions of field verified techniques for controlling emissions from each source to the extent required. The sources covered by this ROAP include ore and mineral mining, open materials handling operations, industrial waste disposal, and fugitive road dust.

PROGRAM ELEMENT NO. 1AB015 – CONTROL TECHNOLOGY – OTHER POLLUTANTS

Research Objective Achievement Plan 21AVA

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AVA-006	Provide sampling and analytical methods and coordination of sample acquisition and analysis for measurements of hazardous pollutants.	Contract	104	Burchard

Research Objective Achievement Plan 21AXM: Carcinogenic and Other Organic Pollutant Control

Objective: A source assessment document will be prepared for each source type. This document will contain sufficient experimentally verified data to permit a decision on the extent to which the source should be controlled. Control technology will be developed as required. This will result in a second product—documents containing descriptions of field verified techniques for controlling emissions from each source to the extent required. Industrial sources covered by this ROAP include petroleum refineries, petrochemical plants, plastics manufacturers, plastics fabricators, solvent users, rendering plants, and other processors of organic materials.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AXM-016	Develop control technology for carcinogenic and other organic pollutant sources.	Contract	104	Burchard

Research Objective Achievement Plan 21BKC: Engineering Applications of Air Pollution Control Technology

Objective: Development and promulgation of technical information and the provision of expert consultation and assistance to facilitate reduction to commercial practice of newly developed control technology. This output will be comprised of reports, meetings and seminars, and other appropriate means of dissemination.

PROGRAM ELEMENT NO. 1AB015 - CONTROL TECHNOLOGY - OTHER POLLUTANTS
Research Objective Achievement Plan 21BKC

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BKC-003	Maintenance of an up-to-date status report presenting technical and economic information on specific commercial applications of air pollution control technology. The report would indentify current and planned installations, current and potential problems, solutions which have been affected or under study, and organizations involved. Reports would be disseminated.	Contract	104	Burchard
21BKC-004	Assessment of technical/engineering problems related to application of air pollution control technology at specific sites (as necessary) and problem solution by direct consultation based on known prior experience or referral to another source of support which has solved the problem or is in the best position to develop a solution.	Contract	104	Burchard
21BKC-005	Timely exchange of information relevant to commercial application of developed technology to solve local and national air pollution problems.	Contract	104	Burchard

AIR POLLUTION CONTROL PROGRAM AREA

PROGRAM ELEMENT NO. 1GB090 – NOISE POLLUTION CONTROL

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: See RFP when issued

Program Element Output: Effective control equipment processes and techniques will be defined, developed, and demonstrated for the prevention and/or control of noise emissions associated with such sources as construction equipment, transportation equipment, and electrical equipment. The objective will be to provide technical data upon which standards can be set. In addition, the coordination of the noise control research programs of all Federal agencies will be conducted under this program element.

Program Element Director (PED):

Mr. Richard E. Harrington
Air Pollution Control Division (RD-681)
Office of Research and Development
Environmental Protection Agency
Washington, DC 20460
Telephone: (202) 755-0658

Research Objective Achievement Plan 21AXV: Coordination of Federal Noise Research, Development and Demonstration (RD&D) Programs

Objective: Federal research coordination is viewed as a resource whereby the Agency will achieve much of its research, development and demonstration requirements. Specific products of research coordination will include the following: (1) a detailed in-depth review of all Federal noise research, development and demonstration programs for incorporation into an integrated Federal noise research program that is designed to provide the technology base for agency regulatory and enforcement activities to control noise that jeopardizes the public health and welfare; (2) an identification of research and technology gaps that exist in current Federal noise programs that must be filled to support the Agency's regulatory and enforcement activities. This information is direct input to the Agency's coordination and research plans to assure that these environmental research needs are satisfied; (3) the opportunity for all agencies engaged in the Federal noise research to exchange information at all levels on a continuing basis to promote program integration and to assure the most cost effective Federal program; (4) elimination of unnecessary duplication, overlapping, and unproductive research programs to assure more effective utilization of Federal resources; (5) research and demonstrated technology that can be used for development and support of noise standards and regulations and the necessary data base for support of Agency enforcement activities; (6) the information and data required for preparation of the Agency's Report to the President and Congress.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AXV-006	Support coordination program.	Contract	14	Harrington

DATA AND INFORMATION RESEARCH PROGRAM AREA

The Data and Information Research Program Area is responsible for planning, coordinating, establishing, reviewing and assessing research, development and appropriate demonstration programs aimed at the establishment of effective research information and data systems, including multimedia or multi-pollutant data analysis and special data handling and processing studies.

Program Area Manager (PAM):

Mr. H. Matthew Bills
Data and Information Research Division (RD-689)
Office of Research and Development
Environmental Protection Agency
Waterside Mall
Washington, DC 20460
Telephone: (202) 755-0635

PROGRAM ELEMENT NO. 1BA029 – LAKE SURVEY

Funds: No new extramural Tasks which are planned for funding during the current Fiscal Year.

Program Element Output: A water quality investigation of about 750 selected lakes and reservoirs and their drainage basins in the contiguous 48 states involving lake, tributary stream and watershed point-source sampling and evaluation. Lake trophic conditions and nutrient(s) limiting aquatic plant primary productivity will be established for each water body. Relative point- and nonpoint-source nutrient loading (and concentrations) will be determined and related to observed lake trophic condition. In selected watersheds, land-use and other characteristics will be related to nonpoint source nutrient run-off.

Program Element Director (PED):

Dr. Donald T. Wruble
Monitoring Operations Lab
Environmental Protection Agency
P.O. Box 15027
Las Vegas, NV 89114
Telephone: (702) 736-2969

Dr. Norbert A. Jaworski
Pacific Northwest Environmental Research Lab
National Environmental Research Center
200 S.W. 35th Street
Corvallis, OR 97330
Telephone: (503) 752-4211

DATA AND INFORMATION RESEARCH PROGRAM AREA

PROGRAM ELEMENT NO. 1HA325 - MONITORING PLANNING AND REVIEW

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $120,000

Program Element Output: Planning, coordinating, establishing, reviewing, and assessing research, development, and appropriate demonstration programs aimed at the establishment of effective research information and data systems, including multi-media or multi-pollutant data analysis and special data handling and processing studies.

Program Element Director (PED):

Dr. S. David Shearer
Quality Assurance & Environmental
Monitoring Laboratory
National Environmental Research Center
Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 549-8411

Mr. George B. Morgan
Monitoring Systems Research & Development Lab
National Environmental Research Center
Environmental Protection Agency
P. O. Box 15027
Las Vegas, NV 89114
Telephone: (702) 736-2969

Research Objective Achievement Plan 22ABW: Development of Environmental Photographic Interpretation Center

Objective: A viable organization, tied to the Federal Community, that is capable of solving regional problems with existing data or through use of the capabilities existing in other federal organizations; a series of environmental oriented keys and demonstration projects that can be utilized by program, Regional, State and local organizations to detect, the presence extent and impact of pollution sources.

PROGRAM ELEMENT NO. 1HA325 – MONITORING PLANNING AND REVIEW

Research Objective Achievement Plan 22ABW

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
22ABW-005	With the aid of industrial contractors determine the uses and capabilities of remote sensor data acquired by government agencies to identify pollution sources, determine ambient conditions and establish trends.	Contract	Mixed	Morgan

EQUIPMENT AND TECHNIQUES PROGRAM AREA

The principal objective of research conducted or supported within the Equipment and Techniques Program Area is to develop methods and instrumentation for the detection, identification, and quantification of pollutants in all media at the lowest significant concentration. This research is necessary to provide measurements on the causes, extent, effects and control of pollution and to assist in the setting of standards and determining compliance with standards.

Thus, the Equipment and Techniques Area is directed towards the development of instrumentation and methods for the detection and quantitative identification of chemical and biological pollutants in air and water, toxic residues in plant and animal tissues and physical pollutants such as heat, radiation and noise in the environment. State-of-the-art reviews, prototype instrumentation development, and pioneering research studies related to the development of new or significantly improved analytical methods or instrumentation are supported.

Program Area Manager (PAM):

Dr. Henry F. Enos
Equipment and Techniques Division (RD-688)
Office of Research and Development
Environmental Protection Agency
Waterside Mall
Washington, DC 20460
Telephone: (703) 755–0646

PROGRAM ELEMENT NO. 1AA010 – INSTRUMENTATION AND ANALYTICAL METHODS DEVELOPMENT

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $ 50,000
Contracts: $965,000

Program Element Output: Measurement methods, both manual and instrumental, required to support Federal, State and local programs for ambient air quality and source emission measurements. Program efforts will be to develop and recommend methods to the standardization program for ultimate adoption and promulgation as EPA approved methods. This program consists of research, development, testing and evaluation activities and covers all needs for measurement methodology of the air pollution control programs including measurement techniques for all classes of pollutants and pollution sources, mobile and stationary.

Program Element Director (PED):

Dr. Paul Altshuller
Chemistry & Physics Laboratory
National Environmental Research Center
Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 549–8411

PROGRAM ELEMENT NO. 1AA010 – INSTRUMENTATION AND ANALYTICAL METHODS DEVELOPMENT

Program Element Director (PED):

Mr. George B. Morgan
Monitoring Systems Research & Development Lab
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P.O. Box 15027
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Research Objective Achievement Plan 21AUN: **Development of Criteria for Selection of Stationary Source Measurement Strategies or Methodology and Instrumentation**

Objective: Standards of performance for new stationary sources allow measurement of emissions by the methods prescribed or by equivalent or alternate methods approved by the Administrator (40CFR 60.8b). The standards also require that EPA provide guidance and assistance on the selection and use of required monitoring equipment. The output of this ROAP will be performance criteria and data upon which the Administrator can adequately assess the capability and accuracy of "equivalent" or "alternate" measurement procedures.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AUN-007	Evaluate isokinetic sampling systems. General Electric prototype and Pollution Monitor Corp system.	Contract	103	Altshuller
21AUN-008	Determine field performance characteristics of *in situ* and extractive NO_x monitoring systems applied to HNO_3 plant emissions.	Contract	103	Altshuller

Research Objective Achievement Plan 21AUO: **Research and Development of a Fine Particulate Methodology**

Objective: Methods/instruments for measuring fine particulate loadings and size distributions in real time.

PROGRAM ELEMENT NO. 1AA010 - INSTRUMENTATION AND ANALYTICAL METHODS DEVELOPMENT

Research Objective Achievement Plan 21AUO

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AUO-010	Development of an improved automated turbidimetric method for sulfate. Analytical methods presently used for the determination of atmospheric sulfate are more or less unsatisfactory. This task involves the development of a rapid, accurate and interference-free automated method. FY 76 funds will be used for the investigation of potential interferences, increase of sensitivity, and a total evaluation of the method.	Contract	103	Altshuller
21AUO-011	Evaluation of effects of substrate and environmental conditions on the collection of sulfate on a filter and development of a reliable collection method for water soluble aero-sulfates. This task will involve a thorough study of sulfate collection in the presence of SO_2 and other critical pollutants under varying atmospheric conditions. This will include coordination and incorporation of literature surveys. The fate of SO_2 under a variety of collection conditions will have to be determined. Based on these studies, an efficient and reliable collection device will be developed, fabricated and fully evaluated with special emphasis on preventing catalytic oxidation of SO_2 and artifact formation.	Contract	103	Altshuller
21AUO-012	Evaluation of an automated methyl thymol blue method for measuring water-soluble atmospheric sulfate. A thorough study of potential interfering substances will be made. The sulfate will probably have to be separated from the various interferences and the final chromogen may have to be separated from excess reagent. Reliability, accuracy and sensitivity of the method will also be tested.	Contract	103	Altshuller

PROGRAM ELEMENT NO. 1AA010 – INSTRUMENTATION AND ANALYTICAL METHODS DEVELOPMENT

Research Objective Achievement Plan 21AUP: **Research and Development of Personal Exposure Dosimeters**

Objective: Personal monitoring devices for use in health effects studies.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21AUP-007	Development of low cost personal dosimetry method for NO_2.	Research Grant	103	Altshuller
21AUP-014	Fabricate commercial prototype NO_2 instruments.	Contract	103	Altshuller
21AUP-022	Development of personal exposure method for total oxidants based on lipid perioxidation reactions.	Contract	103	Altshuller
21AUP-023	Development of personal exposure method for sulfuric acid.	Contract	103	Altshuller

Research Objective Achievement Plan 21BEC: **New or Improved Methods for the Measurement of Organic Pollutants in Ambient Air**

Objective: Reliable laboratory and field methods to identify and measure organic pollutants of high physiological impact such as carcinogens, mutagens, teratogens, allergens, etc. Development of instrumentation and sampling techniques for important organic pollutants including aromatic hydrocarbons, POMs, PCBs, aldehydes, amines, epoxides, imino, heterocyclics, aeroallergens, sulfates, sulfonates, etc.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BEC-008	Develop and standardize equipment and methodology for sampling and analysis of a large number of organic gases and vapors.	Contract	103	Altshuller

PROGRAM ELEMENT NO. 1AA010 – INSTRUMENTATION AND ANALYTICAL METHODS DEVELOPMENT

Research Objective Achievement Plan 21BEC

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BEC-009	Collect atmospheric aldehydes in stable form on solid material and determine the collected aldehydes or their stoichiometrically formed derivatives by gas chromatography or high pressure liquid chromatography.	Contract	103	Altshuller
21BEC-010	Develop and evaluate a solid state device for the complete collection of atmospheric polychlorobiphenyls (PCB).	Contract	103	Altshuller

Research Objective Achievement Plan 26AAM: Instrumentation and Measurement Methods to Determine Aggregate Opacity, Size Distribution Velocity, Composition, and Mass Loading of Particulates from Stationary Sources

Objective: Development and demonstration of fully evaluated manual and continuous measurement techniques for selected parameters and monitoring systems for selected parameters of particulate pollutants emitted from various stationary source with documented techniques for application of the methods and systems to the selected stationary sources. The parameters currently requested include total mass size distribution by mass and number, opacity, chemical composition, mass emission rate, and velocity distribution in the effluent.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAM-043	Develop an EPA Particulate Sampling Train which gives three cut-size fractions for assessment of coarse, fine, and super-fine emissions and evaluate.	Contract	103	Altshuller
26AAM-053	Comparison of remote, in-stack, and expected sampling measurements to establish equivalency.	Contract	103	Altshuller

PROGRAM ELEMENT NO. 1AA010 - INSTRUMENTATION AND ANALYTICAL METHODS DEVELOPMENT

Research Objective Achievement Plan 26AAN: Instrumentation and Measurements for Hazardous Substances Emitted from Stationary Sources

Objective: Measurement methods for hazardous substances (asbestos, mercury, beryllium and other potential candidates such as POM, PCB, Cd, As, Pb, Ni, Cr, V, and Mn as designated by the Administrator) emitted from stationary sources.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAN-015	Feasibility study for asbestos instrument (alternative approach).	Contract	103	Altshuller

Research Objective Achievement Plan 26AAP: Instrumentation and Measurements for Gaseous Pollutants Emitted from Stationary Sources

Objective: New Measurement methods and instruments for gaseous pollutants emitted from various stationary sources. Methods and measurement systems will include improved manual methods, in-stack instrumentation and sensors as applicable. Primary pollutants of interest in support of control procedures are sulfur containing compounds, oxides of nitrogen, halides, and halide compounds, carbon dioxide and hydrocarbons and odiferous materials. Development of supporting technology for secondary measurements such as flow, temperature, sampling and sample conditioning will be accomplished as required to support the primary measurement.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAP-019	Evaluation of H_2 and reduced sulfur instrumentation.	Contract	103	Altshuller
26AAP-037	Develop percentage range H_2O content meter.	Contract	103	Altshuller
26AAP-042	Develop solid sorbent sampling and analyzer techniques for SO_2, SO_3, H_2SO_4 mist, H_3PO_4.	Contract	103	Altshuller

PROGRAM ELEMENT NO. 1AA010 – INSTRUMENTATION AND ANALYTICAL METHODS DEVELOPMENT

Research Objective Achievement Plan 26AAP

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAP-056	Compare *in-situ* extractive instruments and manual methods.	Contract	103	Altshuller

Research Objective Achievement Plan 26ACV: Measurement Methods and Instrumentation for Emissions from Mobile Sources

Objective: Output is in terms of measurement methods and instruments recommended for use in compliance testing and characterization of light and heavy duty vehicles and other mobile sources for purposes of creation and implementation of National emission standards for mobile sources.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26ACV-012	Development of advanced filter media for particulate measurement. Development of sampling and measurement technology for particulate emissions – LDVs.	Contract	103	Altshuller
26ACV-054	Selection and evaluation of certification methods for particulate emissions.	Contract	103	Altshuller

Research Objective Achievement Plan 26ACX: New or Improved Instrumentation for the Measurement of Gaseous Pollutants in Ambient Air

Objective: Development of suitable manually performed laboratory methods for quantitative determination of SO_2, NO, NO_2, H_2S and Se. Prototype field kits will be designed, constructed and evaluated. Development of instrumentation which is simple, reliable, low cost and easy to operate when measuring atmospheric concentration of primary pollutants or other substances resulting from chemical transformations in air.

PROGRAM ELEMENT NO. 1AA010 – INSTRUMENTATION AND ANALYTICAL METHODS DEVELOPMENT

Research Objective Achievement Plan 26ACX

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26ACX-062	Collection and analysis of ammonia. This task is concerned with both gaseous and particulate ammonia and with the development of a reliable sampling device for ammonia.	Contract	103	Altshuller

Research Objective Achievement Plan 26AEK: **New or Improved Methods for the Measurement and Analysis of Ambient Air Particulates**

Objective: Rapid method to measure mass of particulates. Instrumental and laboratory methods for toxic and trace elements. Development of instrumentation and laboratory methods for nitrates, sulfates and sulfuric acid.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AEK-017	Investigate properties of ion selective electrode for nitrate, and determine methods to stabilize response and sensitivity for field operations. Determine method to reduce interferences under field conditions.	Research Grant	103	Altshuller
26AEK-058	Determine whether NO_x is converted to nitrate on a variety of filters. A thorough study of all pertinent parameters and conditions involved in the collection of atmospheric nitrate will be undertaken with the view of developing a fool-proof nitrate collection system with special emphasis on preventing oxidation of NO_2 on the filter.	Contract	103	Altshuller

EQUIPMENT AND TECHNIQUES PROGRAM AREA

PROGRAM ELEMENT NO. 1BA027 – METHODS DEVELOPMENT FOR IDENTIFICATION OF POLLUTANTS

Funds: Available as of July 1, 1974 for support of listed Tasks:

Grants:	$160,000
Contracts:	$100,000

Program Element Output: Physical, chemical and biological methods for detection, identification and measurement of water pollutants. Program efforts will be to: (1) develop sensors and methods that will indicate the presence of pollutants and measure their quantity down to required levels, rapidly and continuously; (2) develop the necessary instrumentation to utilize these sensors and methods to identify, measure and trace pollutants automatically and economically both *in situ* and by remote sensing; (3) develop statistical testing plans to enable rapid screening of water for pollutants with a minimum number of samples; and (4) develop mathematical models that predict the sources of a pollutant from the information obtained in downstream testing.

Program Element Director (PED):

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Dr. David W. Duttweiler
Southeast Environmental Research Lab
Environmental Protection Agency
College Station Road
Athens, GA 30601
Telephone: (404) 546-3134

Research Objective Achievement Plan 05AEF: Develop Methods for Determining Biological Parameters of all Waters

Objective: The ROAP output will consist of new and improved methods for use by biologists in Federal, State and private agencies to restore and maintain the biological integrity of the Nation's waters. These methods will be used to: (a) conduct near-term and long-term water quality monitoring; (b) to measure the effects of pollutants on the diversity, productivity and stability of indigenous biological communities; and (c) for the protection and propagation of balanced populations of shellfish, fish and wildlife, to fulfill the requirements of Sections 101, 104–106, 303–305, 307, 308, 314 and 316 in Public Law 92-500. These methods will be included in the EPA Biological Methods Manual, which will be revised periodically to include new methods.

PROGRAM ELEMENT NO. 1BA027 – METHODS DEVELOPMENT FOR IDENTIFICATION OF POLLUTANTS

Research Objective Achievement Plan 05AEF

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
05AEF-079	Develop centrifugal chromatographic chlorophyll method.	Research Grant	104b	Ballinger
05AEF-081	Develop high pressure plankton preservation method.	Research Grant	104b	Ballinger

Research Objective Achievement Plan 07AAP: Methodology for the Concentration, Recovery and Identification of Viruses From Water

Objective: Device(s) for processing large quantities of waters (including tap water and sewage) on site for the recovery of viruses in a sample form suitable for shipping to laboratories for subsequent quantitation and identification of viruses will be developed. The device(s) will be adaptable to the processing of waters of very different qualities. A rapid, fully automatic system for identifying viruses within 12 hours will be developed.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
07AAP-008	Development and assessment of methods for recovering viruses from feces, sludges, and other solids.	Research Grant	104b	Ballinger
07AAP-012	Comparative evaluations of developing recovery procedures.	Research Grant	104b	Ballinger

Research Objective Achievement Plan 07ABL: Identification of Chemical Pollutants in Industrial Wastewaters

Objective: ROAP output will be a series of reports detailing the pollutants remaining in selected important industrial wastewaters after modern waste treatment and the establishment of general procedures for determining organic and inorganic pollutants in all industrial wastewaters. Spectra of identified compounds will be provided for computerized spectral files to identify organic pollutants in industrial wastewaters.

PROGRAM ELEMENT NO. 1BA027 - METHODS DEVELOPMENT FOR IDENTIFICATION OF POLLUTANTS

Research Objective Achievement Plan 07ABL

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
07ABL-025	Identify pollutants in wastewaters from various synthetic monomer and fiber plants.	Contract	104b	Duttweiler
07ABL-027	Identify pollutants in wastewaters from the plastics and related industries	Contract	104b	Duttweiler

Research Objective Achievement Plan 16ADN: Identification of Organic, Inorganic, and Elemental Chemical Pollutants in Water

Objective: Research reports recommending which separation, concentration, measuring, and interpreting techniques should be used for the identification and quantifying of pollutants. Detailed, standardized methodology will not be provided.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
16ADN-035	Develop computer programs for pollutant identification when the desired reference spectrum is not available.	Research Grant	104b	Duttweiler
16ADN-084	Fifth Annual Symposium on Recent Advances in the Analytical Chemistry of Pollutants.	Research Grant	104b	Duttweiler

EQUIPMENT AND TECHNIQUES PROGRAM AREA

PROGRAM ELEMENT NO. 1EA079 – PESTICIDES IDENTIFICATION METHODOLOGY

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $30,000
Contracts: NONE

Program Element Output: Multi-residue methods for determining the extent of human and animal exposure to persistent and biodegradable pesticides. The program will provide information on the action mechanisms of pesticides and their metabolic products and will develop the methodology for the isolation, detection, identification, confirmation and quantification of pesticide residues, metabolites and other chemical contaminants. Data developed by this program will support administrative decisions concerning the registration of pesticides.

Program Element Director (PED):

Dr. William F. Durham
Pesticide & Toxic Substances Effects Lab
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Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 549-8411

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
PEMP-004	Partial support of conferences held by ACS – Divisions of Pesticides Chemistry, Environmental Chemistry, and Analytical Chemistry.	Research Grant	20	Enos

EQUIPMENT AND TECHNIQUES PROGRAM AREA

PROGRAM ELEMENT NO. 1EA488 – SUBSTITUTE CHEMICALS EQUIPMENT AND TECHNIQUES

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $115,000

Program Element Output: (1) Analytical methods for substitute Chemicals. (2) An assessment of the occurrence of toxic impurities in them. A substitute chemical is a chemical substance/ formulation which has been developed for use as a pesticide but which has not been marketed and is now being considered for marketing as a substitute for banned pesticides.

Program Element Director (PED):

Dr. William F. Durham
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Research Objective Achievement Plan 21BJR: **Determination of Toxic Residues in and Chemical Residues of Compounds Included in the Pesticide Substitute Chemical Program**

Objective: Reports will be submitted detailing results of investigations of toxic impurities found in technical mixtures of pesticides designated substitute chemicals; of application of the substitute chemicals to multiresidue detection systems; of development of GLC detectors for substitute chemicals; of analytical methodology for substitute chemicals.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BJR-005	New analytical techniques for analyses of substitute pesticide chemicals.	Contract	20	Durham
21BJR-007	Development of improved air sampling methodology.	Contract	20	Durham

EQUIPMENT AND TECHNIQUES PROGRAM AREA

PROGRAM ELEMENT NO. 1FA084 - RADIATION METHODS AND MEASUREMENTS

Funds: No new extramural Tasks which are planned for funding in the current Fiscal Year.

Program Element Output: New or improved methods, instrumentation and theoretical models required to determine the concentrations of radioactive materials and the intensity of electromagnetic radiation in various media, with emphasis on biological materials. Program effort will be directed towards the development of laboratory exposure calibration facilities and field measurements systems.

Program Element Director (PED):

Dr. R. John Garner
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PROGRAM ELEMENT NO. 1HA326 - ADVANCED MONITORING TECHNIQUES

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $65,000

Program Element Output: Testing and evaluation of techniques and analytical methodology for advanced remote sensing and *in situ* sensing of environmental parameters. As new technology is developed for sensing environmental pollutants or their effects, plans and programs to test and evaluate capabilities and assess proper techniques for operational implementation will be developed and evaluated to ensure that acquired sensor data are compatible with and of suitable quality for analyses. Monitoring networks will be operated to ensure technical and operational support for Regions, the Office of Research and Development, the Office of Enforcement & General Counsel and the Office of Water and Hazardous Materials.

Program Element Director (PED):

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PROGRAM ELEMENT NO. 1HA326 – ADVANCED MONITORING TECHNIQUES

Program Element Director (PED)

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Research Objective Achievement Plan 22AAE: Groundwater Monitoring Network Design Criteria Development

Objective: A series of reports on (1) kinds and amounts of pollutants in groundwaters, (2) trends of various pollutants under different control strategies, (3) pollutant control technology (4) alternative monitoring strategies and methods with the cost and effectiveness of each, (5) recommended monitoring strategy including data collection and information management, and (6) review of legal aspects related to groundwater activities will be published.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
22AAE-005	Determine effects of mixing activities and subsurface waste disposal on groundwater quality. Prepare appropriate resulting reports with one to include guidelines for evaluation of permit proposals for subsurface waste injection.	Contract	Mixed	Morgan

Research Objective Achievement Plan 22ACQ: Biological Monitoring for Environmental Pollutants

Objective: A series of reports will discuss the detection and measurement of selected environmental pollutants using biological systems as monitoring devices. A combination of field and laboratory studies will examine and report on the specificity, accuracy, precision, interferences, and kinetics of uptake and excretion in potentially useful biological systems.

PROGRAM ELEMENT NO. 1HA326 - ADVANCED MONITORING TECHNIQUES
Research Objective Achievement Plan 22ACQ

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
22ACQ-003	Contract for compilation of data for an annotated bibliography of terrestrial plant responses to pollutants.	Contract	Mixed	Morgan
22ACQ-005	Contract for compilation of data for extended bibliography to cover terrestrial animals, including insects and microorganisms in separate sections.	Contract	Mixed	Morgan

PROGRAM ELEMENT NO. 1LA484 - ANALYTICAL METHODOLOGY FOR ASBESTOS

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $194,000

Program Element Output: Methods and instrumentation to identify and measure concentrations of asbestos in water supplies and in industrial and municipal effluents. Short term objective: A method for identifying asbestos type and for determining mass concentration and size distribution. Long term objectives include rapid survey and field methods.

Program Element Director (PED):

Dr. David W. Duttweiler
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College Station Road
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PROGRAM ELEMENT NO. 1LA484 – ANALYTICAL METHODOLOGY FOR ASBESTOS

Research Objective Achievement Plan 21BED: **Development of Analytical Methodology for Asbestos in Water**

Objective: A method to identify and measure concentrations of asbestos in industrial and municipal effluents and water supplies. The method must identify asbestos type, mass concentration and fiber size distribution.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BED-003	Design and construct automated analytical system.	Contract	104b	Duttweiler
21BED-004	Establish optimum sampling and sample preparation techniques and reference standard preparation techniques.	Contract	104b	Duttweiler

QUALITY ASSURANCE PROGRAM AREA

The objectives of the Quality Assurance Program Area are the planning, establishing, and coordinating an Agency-wide standardization and quality control program to assure that environmental data produced by Federal, State, and local agencies are compatible, accurate, and legally defensible and assuring the selection, evaluation, standardization, and publication of procedures and methods for sampling and analyzing environmental pollutants.

Program Area Manager (PAM):

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PROGRAM ELEMENT NO. 1HA327 – MONITORING QUALITY ASSURANCE

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $ 5,000
Contracts: $942,000

Program Element Output: Planning, establishing, and coordinating an Agency-wide standardization and quality control program to assure that environmental data produced by Federal, State, and local agencies are compatible, accurate, and legally defensible. Assures the selection, evaluation, standardization, and publication of procedures and methods for sampling and analyzing environmental pollutants and reporting data as implemented by the National Environmental Research Centers. Assures the establishment of procedures for and determination of the acceptability and equivalence of methods and instruments for field use. Develops and reviews the implementation of the Agency-wide quality control program for environmental monitoring. Assures the preparation and dissemination of appropriate guidelines and provides technical assistance in the area of quality assurance to Regional Office, State, and local monitoring programs to assure a systematic and coordinated approach for the definition of environmental quality. In addition, evaluates monitoring procedures in use and recommends changes as needed.

Program Element Director (PED):

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PROGRAM ELEMENT NO. 1HA327 - MONITORING QUALITY ASSURANCE
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ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
TECH-004	Partial suport for American delegation to International Standards Organization, Technical Committee 146.	Research Grant	Mixed	Ozolins

PROGRAM ELEMENT NO. 1HA327 - MONITORING QUALITY ASSURANCE

Research Objective Achievement Plan 01AAD: **Validation of Automated Field Instrumentation for Monitoring Water and Wastewater**

Objective: Research reports on evaluation, demonstration, specifications, and recommendations on reliability, accuracy, and performance of available water and wastewater field monitoring instrumentation parametric (and resources permitting, integrated) measurement systems and on automated field sampling systems.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
01AAD-001	Evaluation of a Phosphorus Measurement System.	Contract	Mixed	Ballinger
01AAD-002	Acquisition of single parametric systems for evaluation.	Contract	Mixed	Ballinger

Research Objective Achievement Plan 24AEL: **Validation of Methods for Physical, Chemical, Biological and Microbiological Analysis**

Objective: EPA manuals containing validated methodology for chemical, biological and microbiological analyses, regulations delinating EPA reference methods and research reports summarzing the findings of the validation tests.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
24AEL-016	Technical and editorial support for method studies.	Contract	Mixed	Ballinger

Research Objective Achievement Plan 24AEN: **Development and Supply of Standard Reference Materials and Samples for Water Pollution Measurements**

Objective: Reference samples continually available for quality control programs in Regional laboratories and National Environmental Research Centers of EPA, and available to other federal, state and local agencies and the private sector. As required by Federal Water Pollution Control Act Amendments of 1972, Sections 106(i), 104(a), (b), (d), (f) and Section 304(b), (g), & (i).

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
24AEN-011	Develop contract analytical services.	Contract	Mixed	Ballinger

Research Objective Achievement Plan 26AAF: **Evaluation and Standardization of Methods for Measuring Ambient Air Pollution**

Objective: Reports describing the evaluation and standardization of each method examined.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAF-019	Develop standardized procedure to establish calibration atmospheres of ozone.	Contract	Mixed	Shearer
26AAF-021	Develop standardized procedure to establish calibration atmospheres of nitrogen dioxide.	Contract	Mixed	Shearer
26AAF-024	Refinement and simplification of pararosaniline SO_2 method.	Contract	Mixed	Shearer
26AAF-026	Evaluate one benzo(a)pyrene method.	Contract	Mixed	Shearer

Research Objective Achievement Plan 26AAG: **Evaluation and Standardization of Method for Measuring Emissions from Stationary and Mobile Sources**

Objective: Reports describing evaluation of methods, suggested improvements of methods, and describing the limits of accuracy, precision and application of methods.

PROGRAM ELEMENT NO. 1HA327 – MONITORING QUALITY ASSURANCE

Research Objective Achievement Plan 26AAG

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26AAG-019	Evaluate and collaboratively test particulate method (Method 5) and lead method (Method number not yet designated) in a lead smelter.	Contract	Mixed	Shearer
26AAG-020	Evaluate and collaboratively test particulate method (Method 5) in an asphalt concrete plant.	Contract	Mixed	Shearer
26AAG-027	Evaluate and collaboratively test total reduced sulfur method (Method number not yet designated) in a kraft pulp mill.	Contract	Mixed	Shearer
26AAG-028	Evaluate and collaboratively test hydrocarbon method in a fuel conversion unit.	Contract	Mixed	Shearer
26AAG-029	Evaluate and collaboratively test sulfur dioxide method in a fuel conversion unit.	Contract	Mixed	Shearer
26AAG-030	Evaluate and collaboratively test carbon monoxide method in fuel conversion unit.	Contract	Mixed	Shearer
26AAG-031	Evaluate and collaboratively test PbO_2 Method for oxides of nitrogen emissions.	Contract	Mixed	Shearer
26AAG-032	Evaluate and collaboratively test chloranilate method for sulfur dioxide emissions.	Contract	Mixed	Shearer

Research Objective Achievement Plan 26ADL: **Equivalency Determination of Alternate Air Pollutant Measurement Methods**

Objective: (1) Preparation, evaluation, and publication of equivalency testing protocols. (2) Periodically publish a listing of equivalent methods as approved.

PROGRAM ELEMENT NO. 1HA327 – MONITORING QUALITY ASSURANCE

Research Objective Achievement Plan 26ADL

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26ADL-005	Conduct testing for equivalent or reference method determination for existing monitors and new applications as needed.	Contract	Mixed	Shearer

Research Objective Achievement Plan 26BFE: Development and Supply of Standard Reference Materials and Samples for Air Pollution Measurements

Objective: Development, production and dissemination of reference materials, delivery systems and instructions for use in quality control programs.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26BFE-004	Develop and evaluate interim systems for calibration of ambient SO_2 methods.	Contract	Mixed	Shearer
26BFE-005	Develop dynamic delivery system for CO for auditing purposes.	Contract	Mixed	Shearer
26BFE-006	Develop and evaluate interim system for calibration of ambient CO methods.	Contract	Mixed	Shearer
26BFE-013	Develop SRS for stationary source measurements of SO_2 for auditing purposes.	Contract	Mixed	Shearer
26BFE-014	Develop SRS for stationary source measurements of NO_x for auditing purposes.	Contract	Mixed	Shearer
26BFE-022	Procure analytical services from an independent referee laboratory to check SRM and SRS.	Contract	Mixed	Shearer

PROGRAM ELEMENT NO. 1HA327 - MONITORING QUALITY ASSURANCE

Research Objective Achievement Plan 26BGC: **Development of Quality Control Guidelines and Procedures for Air Pollution Measurements**

Objective: EPA reports will be published recommending quality control guidelines and procedures for research and monitoring measurements resulting from the implementation of the Clean Air Act. The reports will be used by National Environmental Research Centers, EPA Region, state/local air pollution agency, and private laboratory personnel.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
26BGC-005	Preparation of a general quality assurance manual for air pollution measurement systems—source emission monitoring.	Contract	Mixed	Shearer
26BGC-007	Development of guidelines for quality assurance for unleaded gasoline fuel regulation.	Contract	Mixed	Shearer
26BGC-009	Development of guidelines for quality assurance for NSPS Group I (Method 9) and all Group II pollutants.	Contract	Mixed	Shearer
26BGC-011	Development of guidelines for quality assurance for non-federal register air and health measurement systems.	Contract	Mixed	Shearer

SOCIO-ECONOMIC RESEARCH PROGRAM AREA

The Socio-Economic Research Program Area consists of a program of interdisciplinary research aimed at the development and demonstration of the analytic and management techniques required to implement Agency programs at the national, regional and local levels. Such management and analytic tools are necessary to accomplish and validate Agency policy, strategy, decisions, standards, regulations and plans.

Research is accomplished by teams of professional personnel of various disciplines focused in three general areas:

(1) Ecological Impact Analysis: Analysis of institutional effects of various environmental policies; development of comprehensive environmental planning and management capability.

(2) Resource Analysis: Analysis of economic aspects of environmental actions including cost-benefit, cost-risk benefit and trade-off analysis.

(3) Implementation and Methods Analysis: Development of forecasting capability to enable Agency and other decision-makers to anticipate long-range impact of human and institutional activities on the environment.

Program Area Manager (PAM):

Mr. Roger S. Cortesi
Washington Environmental Research Center
Office of Research and Development
Environmental Protection Agency
Waterside Mall
Washington, DC 20460
Telephone: (202) 755-0468

SOCIO-ECONOMIC RESEARCH PROGRAM AREA

PROGRAM ELEMENT NO. 1AA004 - ECONOMIC CRITERIA

Funds: No new extramural Tasks which are planned for funding
in the current Fiscal Year.

Program Element Output: Development of an economic basis for environmental decision-making as it relates to air pollution. To accomplish this goal, the following functions are to be performed: (1) provide Congress, EPA, and the public a comprehensive annual study of the economic consequences of Federal Air Pollution Legislation; (2) evaluate and propose inducements to control air pollution; (3) investigate the economic consequence of specific situations associated with air pollution abatement; (4) conceptualize and assess, in economic terms, the benefits to be derived from air pollution abatement; (5) provide economic information necessary for the development and implementation of air pollution regulations; and (6) investigate, explain and predict the relationship of cleaner air to other environmental and economic goals.

Program Element Director (PED):

Mr. John Knelson
Office of the Director
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PROGRAM ELEMENT NO. 1BA030 - WATER QUALITY IMPLEMENTATION RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: NONE
Contracts: $160,000

Program Element Output: (1) Effective planning and optimization techniques for water quality management; (2) new or improved methods of data acquisition, transmission, processing and application; (3) innovation institutional arrangements for water quality management; and (4) techniques for evaluating the air pollution and solid waste effects of water pollution control. Emphasis will be on the socio-economic aspects. Program results will include reports, recommendations, demonstrations of practicality, and design criteria.

Program Element Director (PED):

Mr. Roger Shull
Washington Environmental Research Center (RD-691)
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Research Objective Achievement Plan 21BFZ: **Use of Impact Analysis in Wetlands to Improve Environmental Quality**

Objective: Reports developing and describing impact assessment techniques applicable to construction actions affecting aquatic and wetland ecosystems. This work will include indirect (secondary) effects stimulated

by impoundment, channelization, diking and filling activities. Project demonstration of techniques as reported with major emphasis on completing the Atchafalaya Management Study. Reports detailing the Federal role in stimulating or triggering development in wetland areas, and outlining the associated environmental benefits and costs.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BFZ-005	Prepare reports advancing the state-of-the-art of employing water management planning as a tool for implementing environmental protection and demonstrate use of improved state-of-the-art.	Contract	104b	Shull
21BFZ-007	Prepare a report documenting the progress made to date in implementing the Coastal Zone Management Act and various state acts with special emphasis on the California Coastal Zone Conservation Act. In particular, the report will detail those areas where differing institutional arrangements might lead to enhanced protection of environmental values within the coastal zone.	Contract	104b	Shull
21BFZ-013	Develop improved methodologies for the assessment of the environmental impact of spoil and fill placement in wet lands, and for the review of such assessment.	Contract	104b	Shull
21BFZ-014	Prepare reports which identify and analyze the relationships between development activities in critical wetland areas and various Federal actions which may trigger or stimulate such activities.	Contract	104b	Shull

PROGRAM ELEMENT NO. 1BA030 – WATER QUALITY IMPLEMENTATION RESEARCH

Research Objective Achievement Plan 21BHF: Implementation of Water Quality Regulations

Objective: A set of procedural guidelines to improve and standardize the implementation of the provisions of P.L. 92–500 to assure consistency, fairness, effectiveness, and economic efficiency.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21BHF-004	Slude Disposal Systems Analysis Phase II.	Contract	104b	Shull

PROGRAM ELEMENT NO. 1DA312 – BEHAVIORAL RESEARCH

Funds: No new extramural Tasks which are planned for funding during the current Fiscal Year.

Program Element Output: Improved understanding of human behavior and of materials systems as they relate to the generation and disposal of solid waste, leading to strategies for reducing solid waste loads and for increasing resource recovery.

Program Element Director (PED):

Mr. Robert Stenburg
Solid and Hazardous Waste Research Lab
National Environmental Research Center
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Telephone: (513) 684–4477

SOCIO-ECONOMIC RESEARCH PROGRAM AREA

PROGRAM ELEMENT NO. 1DA315 - ECONOMIC BENEFIT ANALYSIS

Funds: No new extramural Tasks which are planned for funding
during the current Fiscal Year.

Program Element Output: A quantitative estimate of the social benefits of solid waste management programs. Program efforts will be directed towards developing methodology for estimating the externalities associated with solid waste collection, recycling and disposal and with virgin materials use.

Program Element Director (PED):

Dr. Fred Abel
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SOCIO-ECONOMIC RESEARCH PROGRAM AREA

PROGRAM ELEMENT NO. 1HA091 – STANDARDS RESEARCH

Funds: No new extramural Tasks which are planned for funding during the current Fiscal Year.

Program Element Output: Recommendations leading to adoption of economically efficient and socially equitable standards for the protection and enhancement of environmental values. The standards sought will encompass a broad range of interconnected environmental problems involving ambient environmental quality condition, measurements, and evaluations, waste residuals production and disposal, plant location, land use and transportation controls, materials recycling, emissions data and accounting.

Program Element Director (PED):

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PROGRAM ELEMENT NO. 1HA093 – SYSTEMS EVALUATION

Funds: No new extramural Tasks which are planned for funding during the current Fiscal Year.

Program Element Output: Expansion of the economic and systems analysis capacities of the Environmental Protection Agency and the Office of Research and Development. This expanded capability will be used to evaluate, among other things: alternative environmental improvement strategies; the economic aspects of OR&D program choices; the interactions between the legal and economic systems in environmental matters; the system implications of pesticide use and control; and the effect on the socio-economic system of environmental policies concerning energy production and use.

Program Element Director (PED):

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SOCIO-ECONOMIC RESEARCH PROGRAM AREA

PROGRAM ELEMENT NO. 1HA094 – ECONOMICS RESEARCH

Funds: Available as of July 1, 1974 for support of listed Tasks:
Grants: $ 75,000
Contracts: $148,000

Program Element Output: Economic information for use in environmental decision making. To accomplish this goal, the following functions are to be performed on a continuing basis: (1) provide Congress, EPA and the public comprehensive studies of the economic consequences of current or proposed pollution legislation; (2) evaluate and propose economic means of controlling pollution; (3) investigate the economic consequence of specific situations associated with pollution abatement; (4) conceptualize and assess, in economic terms, the benefits to be derived from pollution abatement; (5) conceptualize and assess in economic terms the direct and indirect costs of achieving pollution abatement; (6) provide economic information necessary in the development and implementation of pollution regulations; (7) investigate, explain, and predict the relationship of pollution abatement to environmental, social and economic goals.

Program Element Director (PED):

Dr. Fred Abel
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Environmental Protection Agency
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Washington, DC 20460
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Research Objective Achievement Plan 17BAB: Economic Analysis of Selected Materials

Objective: Research reports are needed to identify alternative strategies of pest control and their economic costs and benefits to society. For radioactive wastes, assessments of ecnomic risks from exposure will provide useful guidelines to policymakers.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
17BAB-006	Survey choices by various groups. Under conditions of risk and uncertainty of health damages from exposure to radioactive wastes.	Contract	Mixed	Abel
17BAB-007	Conduct a field investigation of the economic aspects of pesticide use decisions.	Research Grant	Mixed	Abel

PROGRAM ELEMENT NO. 1HA094 - ECONOMICS RESEARCH

Research Objective Achievement Plan 20AAA: **Analysis of Pollution Control Benefits**

Objective: Research reports and tabulations estimating the economic benefits realized from the attainment of propsed Federal Air and Water Quality Standards.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
20AAA-020	Analysis of benefits of accomplishing 1983 & 1985 water quality goals.	Contract	Mixed	Abel

Research Objective Achievement Plan 21ARQ: **Economic Analysis of Noise Control**

Objective: Research reports on the assessment of economic benefits from noise control damage functions relating economic welfare losses to various levels and exposure to noise.

ROAP/TASK Number	Task Description	Expected Funding Mechanism	Auth. Leg.	Cognizant PAM/PED
21ARQ-002	Develop economic theory framework to value noise damage.	Contract	Mixed	Abel